News and Perspectives

AGRO-ECOLOGY

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WCR Adapts to Crop Rotation: Shouldn't We Expect the Same Fate for Transgenic Hybrids?

Michael E. Gray and David W. Onstad

The rotation of maize and soybean in the U.S. Corn Belt has been a spectacular pest management success story for western and northern corn rootworms. Unfortunately, since 1995, the luster of this success became a bit more tarnished in east central Illinois and northern Indiana. Western corn rootworms (WCRs) had seemingly found a crack in the seemingly impenetrable fortress of crop rotation.

Although WCRs had demonstrated their genetic plasticity by developing resistance to chlorinated hydrocarbon insecticides in the 1960s and more recently (late 1990s) to methyl-parathion (organophosphate insecticide) and carbaryl (carbamate insecticide) in Nebraska, few entomologists had anticipated the behavioral adaptation to crop rotation.

To understand how this remarkable example of insect evolution occurred, let us return to the early 1960s.

WCRs, unlike northern corn rootworms, are not native inhabitants of the Prairie State. WCRs most likely evolved in the tropics or subtropics of Mesoamerica in association with progenitorial corn (ancestor of corn). Progenitorial corn was probably not abundant and grew in association with other wild plants, such as grasses and cucurbits.

Within the United States, WCRs were first recorded in Kansas in 1868. Before 1955, WCRs were found primarily in Nebraska, eastern Colorado, Kansas, and isolated pockets of South Dakota and Iowa.

Some entomologists think of WCRs as "man-made" pests because they followed the trail of corn beneath center pivot irrigation systems eastward across Nebraska. By 1964, WCRs had reached northwestern Illinois.

Because it was known that WCRs prefer to lay their eggs in corn, extension entomologists from the start recommended crop rotation as a viable pest management strategy. Eggs overwinter in the soil and larvae begin to hatch in late May or early June the following spring. Rootworm larvae cannot survive on soybean roots, making this crop an ideal alternate with corn.

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WCR Adapts to Crop Rotation, continued

Although crop rotation was advocated as the ideal management approach for western and northern corn rootworms, many livestock producers and those who farmed more erosion-prone soils, still continued to produce "continuous" or non-rotated corn. Soil insecticide use in continuous corn reached significant levels (over 90 percent of acres) across many areas of the Corn Belt, including northern Illinois.

Because of the widespread use of the very persistent cyclodiene soil insecticides, resistance soon ensued.

In other areas of the Corn Belt, including east central Illinois, the rotation of corn and soybeans proved to be the primary management strategy to limit corn rootworm damage. This approach worked exceedingly well for nearly a quarter of a century.

Then, just as resistance had developed to the chlorinated hydrocarbon soil insecticides, a behavioral adaptation to a cultural pest management tactic occurred.

This adaptation took the form of a change in the egg-laying behavior of WCRs. WCRs in east central Illinois and northern Indiana no longer rely exclusively on corn as their egg-laying site. Instead, WCRs in these areas now utilize soybeans and other crops for egg-laying purposes.

Although cornfields have not been completely abandoned by egg-laying females, the egg-laying options have expanded. Because we failed to integrate pest management strategies, and instead, relied exclusively on a single-tactic approach, selection pressure increased and WCRs once again squeezed through an evolutionary crack.

In retrospect, we should not have been so surprised.

In 1987, some rotated seed-production cornfields near Piper City in Ford County had significant levels of WCR larval injury. By 1995, WCRs were inflicting serious economic losses to producers in east central Illinois and northern Indiana. By and large, these were growers who had rotated corn with soybeans for decades without the use of any soil insecticide. In fact, crop rotation was so effective as a control tactic that most producers did not have insecticide units on their planters.

Since 1995, however, soil insecticide usage in rotated cornfields has escalated significantly across the eastern Corn Belt. The economic impact has been impressive, with soil insecticide costs averaging approximately $15 per acre.

Preliminary research suggests that a more diverse cropping system may be more sustainable by preventing the development of resistance to crop rotation or by stopping its expansion into new regions. A diverse agricultural landscape is one that includes more than 20 percent of lands planted with other crops that may or may not be part of a rotation with corn and soybean. Other crops reduce the success of the mutant WCR and its harm to corn.

Without at least 5 percent to 10 percent continuous corn in the landscape, development of rotation resistance is almost certain.

Because of the insecticide resistance problems in Nebraska and the failure of crop rotation to limit WCR larval injury in the eastern Corn Belt, producers are justifiably curious about the potential entry of transgenic cultivars in the market-

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place for corn rootworms. On a national scale, producers may eventually invest more than $400 million (annually) in transgenic technology fees (assumes a cost of $15 per acre) to limit corn rootworm damage.

The level of adoption of Bt hybrids by American producers to prevent European corn borer damage will pale in comparison to the market demand for transgenic corn rootworm cultivars.

Prior to the commercialization of Bt hybrids, most farmers failed to scout for European corn borers and only rarely were insecticides used, particularly for the second generation. In sharp contrast, soil insecticide use remains the norm for corn rootworms and producers are expected to readily substitute one input for the other.

Concerns over the potential development of resistance to transgenic rootworm cultivars are well justified considering what is known about WCRs:

- dispersal characteristics of larvae and adults
- narrow host range
- feeding on corn by larvae and adults within a single growing season, and
- a proclivity of resistance development to several classes of insecticides.

Our mathematical model has predicted that a refuge of non-transgenic corn will be needed to delay resistance by the WCR to transgenic corn. Since 20 percent to 25 percent is the standard in Illinois for European corn borer management with transgenic corn, this will likely be the initial recommendation for an in-field or adjacent-block refuge in managing WCRs.

Depending on the effectiveness of the transgenic corn in killing larvae and the inheritance of resistance in the insect population, resistance to transgenic corn may develop in as little as 5 years or may never be observed. If inheritance is dominant, then resistance is all but certain. If it is recessive, the technology may remain effective for many years.

Unlike the use of transgenic insecticidal cultivars for European corn borer management, the use of transgenic hybrids for corn rootworms could work in concert with existing scouting programs and established economic thresholds. By monitoring their fields for corn rootworm adults in late summer, farmers could base their decision to use transgenic rootworm hybrids the following spring upon scouting input and knowledge of thresholds.

The C-FAR funded research team of Michael Gray, Charles Guse, Scott Isard, David Onstad, Eli Levine, Sue Ratcliffe, and Joe Spencer, all with at the University of Illinois and the Illinois Natural History Survey, plans to continue investigations to find more sustainable solutions to WCR management.

Their integrated, multidisciplinary research program earned one of the first-ever C-FAR Sentinel Grants from the Office of Research, College of Agricultural, Consumer and Environmental Sciences. The grant program supports innovative discovery and problem-solving research. Researchers will investigate mechanisms behind the behavioral change to better understand why and how the WCR variant evolved. They also will study diet, flight and behaviors that might provide clues for pest monitoring and management recommendations. Other research goals include development of genetic diagnostic tools, models for predicting spread and effectiveness of long-term strategies, transgenic corn rootworm hybrids, and management practices to prevent resistance from developing.

Michael E. Gray is a professor and U of I Extension IPM Coordinator with the Department of Crop Sciences, College of Agricultural, Consumer and Environmental Sciences. David W. Onstad conducts research in systems ecology and holds a joint appointment with the College of ACES Department of Natural Resources and Environmental Sciences and Illinois Natural History Survey.

Participatory IPM Program for WCR Gains Widespread Acceptance

Susan T. Ratcliffe, Kevin L. Steffey, and Michael E. Gray

In 1998, University of Illinois Extension entomologists unveiled a monitoring program for adult western corn rootworms (WCRs) in soybean fields to predict root injury in rotated corn.

The program's preliminary threshold was based on a 3-year participatory on-farm research program conducted in east central Illinois. A scouting protocol and predictive threshold were described in an insect information sheet (http://ipm.uiuc.edu/publications/infosheets/1-wcornr/wcornr.html). The information was distributed to growers in high- and moderate-risk areas where crop rotation had failed to provide adequate control of WCRs.

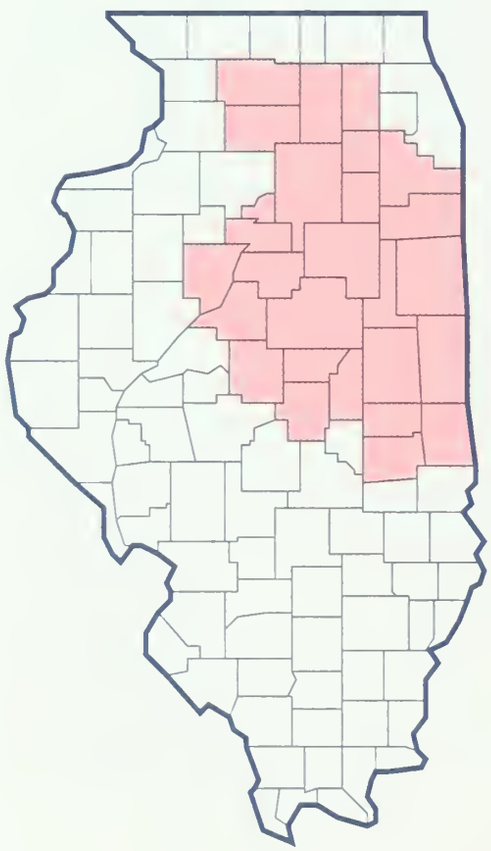

Figure1. Scouting data were recorded for 149 sites in 27 counties in 1998.

During July 1998, U of I Extension entomologists distributed 5,000 information sheets, and the demand for Pherocon AM sticky traps outpaced the supply. The information sheet includes a Web site address for producers and scouts to report their adult counts online for inclusion in a database.

Scouting data were received for 149 sites in 27 Illinois counties in 1998 (Figure 1). This information was summarized and distributed to U of I Extension educators, producers, and industry personnel to assist them in making more informed management decisions about WCRs.

Individuals who participated in the 1998 Western Corn Rootworm Monitoring Program were invited to continue their involvement with this research effort in 1999. A producer workshop was conducted in March 1999 to discuss refining the preliminary threshold by collecting additional monitoring and root rating data. Those in attendance had the opportunity to discuss the WCR problem with U of I entomologists Michael Gray, Kevin Steffey, Eli Levine, Joe Spencer, John Shaw, and Susan Ratcliffe.

As a result of the workshop, 100 participants were enrolled in the 1999 Root Rating Program. In order to assess the level of WCR larval injury, U of I Extension entomologists worked with Extension educators, producers, and industry personnel to coordinate the digging, tagging, transporting, and evaluation of roots.

The preliminary threshold of two to seven adults per trap per day was raised to five to 10 adults per trap per day. This adjustment in the threshold may result in fewer rotated cornfields treated with a soil insecticide at planting.

Adult populations in soybeans during 1998 and root-injury ratings in 1999 were combined with data sets from 1996 and 1997 on-farm research efforts. The combined analysis resulted in a new and tentative economic threshold for WCR adults trapped in soybean fields with Pherocon AM traps.

The preliminary threshold of two to seven adults per trap per day was raised to five to 10 adults per trap per day. This adjustment in the threshold may result in fewer rotated cornfields treated with a soil insecticide at planting.

Several field days were conducted during July 1999 by U of I Extension specialists Dan Anderson, Department of Natural Resources and Environmental Sciences, and Susan Ratcliffe, Department of Crop Sciences, in cooperation with U of I

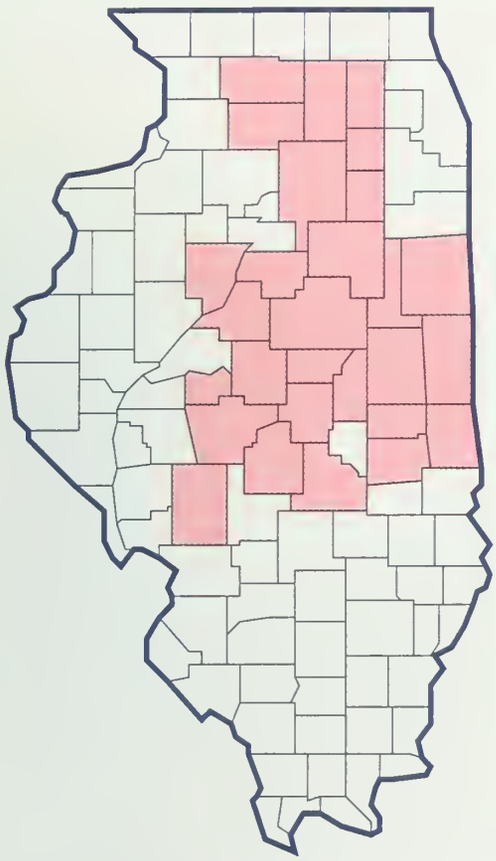

Figure 2. The Western Corn Rootworm Monitoring Program continued in 1999 and expanded to 269 sites in 26 Illinois counties.

Extension educators, the Illinois Stewardship Alliance, and the U of I Agroecology/Sustainable Agriculture Program.

The distribution of free sticky traps, funded by the Agroecology/Sustainable Agriculture Program, encouraged growers to monitor soybean fields for adult WCR. The Western Corn Rootworm Monitoring Program continued in 1999 and expanded to 269 sites in 27 counties in Illinois (Figure 2). Adult WCRs were detected for the first time in Christian, Menard, Sangamon, and Shelby counties.

A summary of these data was prepared and distributed to keep growers in Illinois informed of the

continued on next page

R E S O U R C E S

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General Information

Appropriate Technology Transfer for Rural Areas (ATTRA), P.O. Box 3657, Fayetteville, AR 72702; offers a series of publications on agronomy and pest management covering various aspects of ecological pest management. (800) 346-9140, www.attra.org

Sustainable Agriculture Network (SAN), Hills Building, Room 35, University of Vermont, Burlington, VT, 05405-0082; (802) 656-0484; www.sare.org. As the national outreach arm of USDA's Sustainable Agriculture Research and Education (SARE) program, SAN disseminates information through electronic and print publications, including:

- **Building Soils for Better Crops, 2nd Edition.** How to manage soils to produce healthy crops while protecting the environment. $19.95 + $3.95 s/h to Sustainable Agriculture Publications. (See address above.)
- **Managing Cover Crops Profitably, 2nd Edition.** Practical information about cover crops. $19 + $3.95 s/h to Sustainable Agriculture Publications. (See address above.)
- **Steel in the Field: A farmer's guide to weed management tools.** A farmer-oriented handbook with descriptions of tools, roles, designs, and costs. $18 + $3.95 s/h to Sustainable Agriculture Publications. (See address above.)

Alternative Farming Systems Information Center (AFSIC), National Agricultural Library, Rm. 304, Beltsville, MD 20705, (301) 504-6559; (301) 504-6409 (fax); afsic@nal.usda.gov; www.nal.usda.gov/afsic. Offers bibliographic reference publications on ecological pest management via the Internet.

density and distribution of the new strain of WCR populations.

U of I Extension entomologists continue to recommend use of the monitoring program to predict root injury in rotated cornfields and to track the spread of the new WCR strain. This year, approximately 25,000 Pherocon AM sticky traps have been distributed free of charge from U of I Extension, the Department of Crop Sciences, and the Illinois Department of Agriculture Conservation 2000 Sustainable Agriculture Grant Program.

More than 50 counties in Illinois will be involved in the monitoring program this year (Figure 3) and many of this year's participants are monitoring their fields for the first time using Pherocon AM sticky traps.

Any individual monitoring soybeans for WCR adults with Pherocon AM sticky traps may report their data to

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Online reporting can be made at http://ipm.uiuc.edu/agriculture/corn/wcrscout/wcrscout.html.

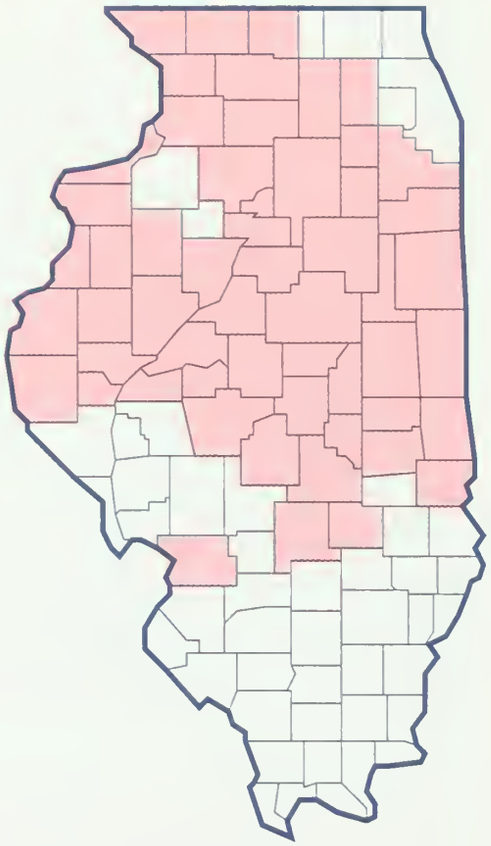

Figure 3. Counties participating in the 2000 WCR Monitoring Program.

Individuals reporting their scouting data will automatically receive a copy of the 2000 Western Corn Rootworm Monitoring Program Summary.

Susan T. Ratcliffe, Kevin L. Steffey, and Michael E. Gray are U of I Extension entomology specialists with the Department of Crop Sciences, College of Agricultural, Consumer and Environmental Sciences.

RESOURCES

Publications

Agroecology: The Science of Sustainable Agriculture (2nd ed.) by Miguel Altieri. Key principles of sustainable agriculture through case studies of sustainable rural development in developing countries. $28 to Perseus Books, Group Customer Service, (800) 386-5656; westview.orders@perseusbooks.com; www.westviewpress.com/

Alternatives in Insect Pest Management—Biological and Biorational Approaches by University of Illinois Extension. Information and evaluation of the safety and effectiveness of alternative insect pest management—microbial insecticides, botanical insecticides and insecticidal soaps, attractants, traps, beneficial insects, and predatory mites. 75 pages. Free/web only. www.ag.uiuc.edu/~vista/ pdf_pubs/altinsec.pdf

Alternatives to Insecticides for Managing Vegetable Insects by Kimberly A. Stoner. Proceedings from a farmer/scientist conference that exchanged experience and research on alternatives to insecticides for vegetable growers in the Northeastern U.S. Free from NRAES Cooperative Extension, (607) 255-7654; NRAES@cornell.edu; http://NRAES.org

Best Management Practices for Crop Pests by Colorado State University Extension. Integrated pest management oriented to Colorado and western U.S. crops and pests. Bulletin XCM-176. $2 to The Other Bookstore, (970) 491-2961; cerc@vines.colostate.edu; www.colostate.edu/ Depts/CoopExt/PUBS

Good Beetle, Bad Plant

Robert N. Wiedenmann, David J. Voegtlin, and Susan L. Post

The loosestrife biological control project has been the launching pad for environmental education materials detailing the importance of biodiversity, wetlands, and controlling exotic species.

Imagine viewing a marsh in northern Illinois and seeing a vast, hazy, purple brilliance stretching to the horizon. What a gorgeous view of a spectacular wetland! This is a good thing, right?

Now imagine walking into an Illinois marsh and seeing hundreds of dead plants, foliage stripped bare by feeding insects. Thousands more damaged plants that did not produce their brilliant purple flowers. This is a bad thing, right?

No, wrong in both cases.

The brilliant purple plants are an exotic invader—purple loosestrife—dominating many wetlands at the expense of native species. And the second scene is good, because it demonstrates the power of biological control—using natural enemies of the invader to control it.

So, we have good beetle, bad plant.

Exotic Wetland Invader

Purple loosestrife (*Lythrum salicaria*) is a broad-leafed perennial wetland plant, up to 2.5 meters tall, that came to North America from Eurasia in the early 1800s. The most likely source of the invader was soil containing loosestrife seeds that was used as ballast in ships sailing to the New World. Once the ships docked in the New World, the ballast was dumped overboard, allowing loosestrife seeds to sprout. Also, the plant was introduced as an herbal and by beekeepers because the flowers are an excellent source of nectar.

Although loosestrife got its foothold in the Northeast, the weed moved inland following construction of the Erie Canal, which provided both the disturbance and a dispersal opportunity. By 1840, the spread of loosestrife was closely related to canal traffic moving inland from the northeast shipping areas.

Two twentieth-century programs allowed loosestrife to spread further west. Under the Federal Reclamation Act of 1902, acreage under irrigation significantly increased, creating perfect habitats for loosestrife to invade. Also, the system of interstate highways increased the

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Photo by Susan Post

Purple loosestrife (Lythrum salicaria) came to North America from Eurasia in the early 1800s. The plant's hardiness, tolerance of a wide variety of moisture and nutrient regimes, and virtual freedom from insect pests and disease made it a formidable invader. In many places in Illinois it forms dense stands that can outcompete and exclude native plants.

Photo by David Voegtlin

Two nearly indistinguishable leaf-feeding beetle species (*Galerucella*) are being mass-reared and released against purple loosestrife. The adults are small brown beetles (about 3.5 to 5 mm in size). They feed voraciously on the loosestrife, creating shot-hole damage on the leaves.

spread, due to the disturbance from construction and by cutting through mountain ranges.

Many characteristics of loosestrife make it a formidable invader—hardiness, tolerance of many moisture and nutrient regimes, large number of seeds produced, and virtual freedom from insect pests and disease. Abundant, long stems of flowers present from July to September make loosestrife an attractive garden plant, which has contributed to its spread.

Plants produce large quantities of seeds, about the size of ground pepper, that are dispersed by wind, flowing water or by adhering to the fur, feathers, or feet of wetland mammals and birds.

Limited Control Methods—The Case for Biological Control

Many exotic weeds and insects have been brought under control using the approach of biological control. This works by reuniting a pest—whether weed or insect pest—with its ancestral natural enemies. Those are the predators, parasites, diseases (or herbivores, in the case of weeds) that kept the species in check in its native habitat. Weed biological control projects have used 350-plus species of insects and pathogens against 133 plant species around the world, with numerous permanent successes.

Usually, biological control represents the last, best hope for fighting many of the worst invaders. Purple loosestrife is a prime example.

Vast stands of loosestrife defy most control efforts. Hand picking works only in the smallest stands when the plant first arrives. In a few cases flooding may kill loosestrife, but many of the worst infestations are in standing water. In addition, flooding can kill already threatened native plants.

Burning simply annoys the plant. Aboveground stems and foliage die every winter anyway, so fire only burns those parts that are already dead. Hand application of herbicides to large infestations is impractical and costly, may be effective only in the smallest stands, and must be continued for years. In fact, both burning and herbicide use may be counter-productive: at some sites burning or herbicide use have led to worse loosestrife infestations.

The lack of options is why biological control has been welcomed—it is the only alternative in this case.

Research by the U.S. Fish and Wildlife Service and Cornell University in the 1980s identified several natural enemies of loosestrife in its native European habitat. Five species of beetles were selected as the most promising and most host-specific. Four of these have been introduced through quarantine into the United States for distribution and release. Two leaf-feeding species, *Galerucella calmariensis* and *G. pusilla*, have been released in large numbers, and eggs of a root-feeding weevil, *Hylobius transversovittatus*, have been distributed in small numbers. Finally, two flower-feeding weevils have been identified, one of which (*Nanophyes marmoratus*) has had limited distribution.

The biology of the *Galerucella* species is the best understood. Depending on spring conditions, adult beetles emerge from hibernation about mid-May in Illinois and begin feeding. Leaves show characteristic "shot-hole" feeding damage.

Photo by David Voegtlin

Purple loosestrife is a broad-leafed, non-woody perennial that when mature can range in height from 1.5 to 8 feet.

Oviposition begins soon, with eggs and beetle larvae seen in June.

After eggs hatch, young larvae feed on and damage the growing tip, preventing growth, flowering and, therefore, seed production. Older larvae feed on and skeletonize the leaves. Full-grown larvae then move down the stems to pupate below the plant. New adults emerge in late summer, feed, and prepare for overwintering. Usually only one generation per year is seen.

Biological Control of Purple Loosestrife in Illinois

Biological control of purple loosestrife is being implemented in many states, but the project in Illinois is one of the strongest. In 1994, a coalition of Illinois county and state agencies purchased 7,000 adult *Galerucella* beetles (both species), which were released into field cages at seven sites in northern Illinois.

In winter 1994-95, this coalition contacted the Illinois Natural

History Survey (INHS) for help. Although the state and county land managers had responsibility for managing their respective sites, they lacked an understanding of biological control and facilities to rear biological-control agents. With an expanded partnership, we developed a multi-year plan to rear and distribute insects throughout northern Illinois, which also led to large-scale adoption of the project by classroom educators and youth groups throughout the state.

At INHS, large-scale production of *Galerucella* beetles began in spring 1995. Hundreds of roots were dug and transported to the Survey's greenhouse. Roots were potted and plants were caged in wire tomato cages and then covered with mesh bag cages. Plants were inoculated with 20 to 30 adult *Galerucella* and kept caged either in greenhouse rooms or in outdoor cages.

After 4 to 6 weeks, plant foliage had been stripped and new adult beetles were emerging. Beetles were collected daily and readied for shipment (or delivery) to sites in northern Illinois.

Photo by David Voegtlin

The larvae after four molts are large, fat, and orange-yellow. Young larvae prefer to feed on the developing leaf and flower buds, while the older larvae will feed on any part of the plant.

And gratefully, even in the midst of the Galerucella feeding frenzy, stood untouched—or just nibbled—plants of other species.

The modest release of 7,000 beetles in 1994 was just the beginning. By 1999, more than 1.5 million *Galerucella* had been released at 120 sites in Illinois. Information about release sites can be accessed at the Survey's Purple Loosestrife Web site (http://www.inhs.uiuc.edu/cbd/loosestrife/bcpl.html).

As the project matured, we trained collaborators to make releases and monitor their sites. Due to their increased confidence, we implemented a program of on-site rearing in 1997.

Collaborators dug and potted loosestrife roots, caged the plants with mesh bags, and placed the pots into children's wading pools. When plants were about 2 feet tall, they were inoculated with overwintered beetles sent from INHS, and the plants were kept outdoors under ambient conditions. After the foliage was stripped and new adults were noted, the pots were moved to nearby wetlands. The cages were removed, liberating hungry beetles.

Using on-site rearing, collaborators have produced an estimated 250,000 beetles for release at their own sites.

The loosestrife biological control project has been the launching pad for environmental education materials detailing the importance of biodiversity, wetlands, and controlling exotic species. In three years, we have taught approximately 125 educators in all-day workshops, and provided them with curriculum materials and all necessary supplies to grow loosestrife and beetles in their classrooms. The beetles the students grow in their classrooms are released into nearby wetlands, demonstrating to students the value of wetlands that are often in their own backyards, and making the students part of the biological control process.

Signs of Impact

Reduction of Flowering: Although other sites in North America were showing signs of impact by 1995, little damage was seen in Illinois until 1996. That year, sampling at Hosah Prairie, one of the initial release sites, showed promising signs. This site, adjacent to Illinois Beach State Park, in Zion, Illinois, had several discrete, small (5 to 10 meter diameter) sand pools, which held water and large numbers of loosestrife plants. Further inland were large stands of loosestrife.

Within three of these pools, a few hundred *Galerucella calmariensis* were released into field cages in 1994. We have followed the results at this site each year and have seen the beetles stop any growth of this plant population. By 1999, beetle feeding had reduced loosestrife to a "background" plant, with little impact on native species.

Devastation of the Weed: A different kind of impact was seen at two other sites—one in northwestern

continued on next page

Illinois and the other in the Chicago region.

At a railroad yard in Savanna, Carroll County, 1,000 *Galerucella* adults were released in 1994 at three discrete sites. In late July 1997, Ed Anderson, a regional biologist with the Illinois Department of Natural Resources, received a shipment of *Galerucella* from the INHS and went to release them. As he later recounted, he did not release these beetles because "there were so many dead plants, he didn't think the beetles would have enough to feed on." This was the first sign of true impact on loosestrife in Illinois.

When Savanna was checked later that summer, plants were devastated at all three release sites, with defoliation up to 150 meters away. All three release sites were in standing water, with water knee-deep at one site. The sight at these release points was like a bull's-eye: a circle of brown, defoliated plants, 15 to 30 meters in diameter, surrounded by green, unflowering plants, which were surrounded at a distance by purple flowering plants.

And gratefully, even in the midst of the *Galerucella* feeding frenzy, stood untouched—or just nibbled—plants of other species. This showed us that the beetles remained host specific. Since then, flowering has been greatly reduced over the entire site, and the beetles have spread over a mile away to a National Wildlife Refuge filled with loosestrife.

Even more important, at least 17 species of native wetland plants have been found where previously loosestrife was seen almost exclusively.

This same result was seen in 2000 in southeastern Cook County. Beaubien Woods, part of the Cook County Forest Preserve District, is a mix of oak forest and wetland that is dominated by loosestrife. (Unfortunately, the oak forest also is invaded by another exotic species—garlic mustard.) Releases of beetles in 1996 and 1997 led to well-established populations of *Galerucella* by 2000. Soon, stripped plants were seen throughout the site and again, beetles dispersed to other wetlands nearly two miles away.

The Future of Purple Loosestrife in Illinois

It is too early to tell whether loosestrife is still "on the loose" or now may be "on the run." Although releases have been made at approximately 120 sites in Illinois, many more sites remain to be targeted.

The spread of beetles from established populations will help fill in the gaps. Many private sites, where wetland mitigation projects are ongoing, will be new targets.

Despite the efforts, there will never be zero purple loosestrife, because biological control will not eradicate the exotic species. But, if the sight at Hosah Prairie is any indication, we all hope loosestrife will become a background splash of purple color in the wetlands.

Biological control, even if it puts loosestrife "on the run," is only a part of the solution. Other exotic species are waiting in the wings, ready to fill in the void left by fewer loosestrife plants. Aggressive replanting of native species will have to be part of the long-range management of these wetlands, to avoid having an even more serious problem—one that may not have a biological-control solution.

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Or, visit the Survey's Purple Loosestrife Web Site at:
http://www.inhs.uiuc.edu/cbd/loosestrife/bcpl.html

Robert N. Wiedenmann, David J. Voegtlin, and Susan L. Post are researchers with the Illinois Natural History Survey, Champaign, Illinois.

R E S O U R C E S

Videos

"No-Till Vegetables: A Sustainable Way to Increase Profits, Save Soil and Reduce Pesticides." Pennsylvania farmer Steve Groff. Covers no-till vegetable production and methods to control weeds using cover crops. $21.95 +$3 s/h to Cedar Meadow Farm, (717) 284-5152; www.cedarmeadowfarm.com

On the Research Front:
Pest Research

Researchers at the University of Illinois and Western Illinois University investigate a variety of topics related to insect, weed, and disease pests and management options. Following are updates on progress of just a few projects. This research was funded in part through the Illinois Council on Food and Agricultural Research (C-FAR).

Consider Issues, Facts, Historical Perspectives

Researchers are working to develop a well-balanced, understandable resource to assist citizens in public discussions at local- and state-level "town meetings" where agriculture, pest management, toxicology, risk assessment, and regulation are the concerns. The information will be published as printed and Web documents.

Leaders in agricultural and environmental groups, representatives of state and local governments, as well as University of Illinois Extension specialists and educators, will review information.

A conference and a series of community meetings are planned for the summer of 2001 to help make people aware of these resources.

U of I investigators on this project include Richard Weinzierl and Cleo D'Arcy. C.A. Sheppard of Washington State University is a co-author.

Smart Sprayer Gets Smarter

The prototype for a real-time, plant-sensing system that can distinguish crop plants from weeds and also determine weed density is proving itself in field tests. The system combines computer, video, and variable-rate nozzle technologies. The goal is to capitalize on technology that can be used to reduce the amounts of herbicides applied to farm fields. This strategy could help prevent agricultural pollution from field operations.

Researchers are refining the smart sprayer systems, including the computer-vision sensing system and the chemical input-dosage expert system. They also are developing an information database. Detailed diagnostics are expected to reveal how the system design impacts the overall performance so that the technology can be further optimized and brought closer to commercialization.

U of I investigators on this project include Lei F. Tian and John F. Reid.

Research Focuses on Cattle Flies

Researchers are going on-farm to test two Pteromalid parasitoids for managing cattle flies. They selected operations with less than 600 head of cattle onsite at any time and where flies were a problem in the summer. In addition, they wanted farmers who were interested in avoiding pesticide use and were willing to provide them with free access to facilities.

A two-year project, the on-farm research will continue through summer 2000. Preliminary data indicate variation in the ability of both parasitoid species to find hosts, but show that they are attacking and killing fly pupae throughout the summer. As part of the project, researchers also are conducting studies to determine the life span and oviposition rate of the parasitoids under field temperatures to see whether both species can survive and reproduce efficiently in the heat and humidity of Illinois summers.

U of I investigators on this project include Carl Jones, Douglas Hutchens, and Richard Weinzierl.

Bt Resistance Findings Published

Illinois farmers can more accurately evaluate the benefits of Bt corn (field corn and sweet corn) and make better decisions about purchasing and managing the hybrids with unbiased evaluations from U of I trials. Resistance management recommendations are included in the Illinois Agricultural Pest Management Handbook (IAPM-99). For ordering information, call or write (800) 345-6087; acespubs@uiuc.edu.

Instances of Bt-resistant corn larvae surviving on Bt corn in the field were rare in this study, but even the rare finds indicate the importance of resistance management plans, according to researchers. This research contributed to development of resistance management plans based on non-Bt refuge acres.

In addition, the team generated specific descriptions of the toxicity of Bt to Illinois populations of the European corn borer.

U of I Extension Entomologist Richard Weinzierl was principal investigator for this project. Christopher Pierce, a master's student, conducted laboratory bioassays to

continued on next page

describe the toxicity of Bt toxins to European corn borers. His findings of direct negative impacts of Bt toxins on the pathogen *Nosema pyrausta* support the practice of using non-Bt refuges, not only for resistance management but also to maintain this important natural enemy of corn borer.

Pesticide Alternatives Explored

Scientists with the Agriculture Department at Western Illinois University are taking a systems approach to research on the Allison Farm, a pesticide-free farm near WIU. Studies are designed to evaluate pesticide-free weed control strategies and various cropping and tillage practices through several crop rotations. Researchers also are working to determine the economic feasibility of pesticide-free and organic crops, a growing interest among western Illinois farmers.

Under way for five years, the research focus has expanded from pesticide-free crop production to also include the challenges and opportunities of organic farming: weed control without use of herbicides; pest control without use of insecticides; and fertility management without use of synthetic fertilizers. Some of the options under study include use of ridge tillage and cover crops to control weeds; use of crop rotations to reduce insect problems; and use of unprocessed minerals, manure, biological products, and crop rotations to improve soil fertility.

According to researchers, findings from these studies could help farmers reduce capital inputs and allow them to take advantage of special marketing opportunities, while preserving their soil's productivity and protecting the environment.

WIU investigators on this project include Jerry Vigue, Gerald Carlson, and Tim Howe.

Research summaries provided by Tina Prow, Information Technology and Communication Services, College of Agricultural, Consumer and Environmental Sciences, University of Illinois. For more information on these and other C-FAR funded projects, check out the "Research" link on the C-FAR Web site (http://www.ilcfar.org/).

RESOURCES

Publications

Biodiversity and Pest Management in Agroecosystems by Miguel Altieri. Explores entomological aspects of agriculture and analyzes the ecological basis for the maintenance of biodiversity in agriculture. $39.95 (five or more:$24.95) from The Haworth Press, Inc., 1-800-HAWORTH; getinfo@ haworthpressinc.com; www.haworthpressinc.com

Common Sense Pest Control. W. Olkowski et al. How to control pests using natural mechanisms. 715 pages. $29.95 plus $3.95 s/h to Taunton Direct, Inc., (800) 888-8286.

Ecologically Based Pest Management: New Solutions for a New Century. Ralph Hardy offers a vision and strategies for creating a solid knowledge base to support such a system. $20 to Conservation Technology Information Center, (765) 494-9555; hopper@ctic.purdue.edu; www.ctic.purdue.edu/CTIC/CTIC.html

Insect Pest Management in Field Corn. J. Van Duyn discusses cultural practices useful in controlling various insect pests. Free from North Carolina Cooperative Extension Service, (704) 873-0507.

Michigan Field Crop Pest Ecology and Management. Mutch, D.R., M.A. Cavigelli, S.R. Deming, M.A., L.A. Frost, and L.K. Probyn (eds.). Bulletin E-2704. $12 to Michigan State University Extension. (517) 355-0240; msue@msue.msu; www.msue.msu.edu/

Natural Enemies Handbook: The Illustrated Guide to Biological Pest Control. Mary Louise Flint and Steve H. Dreistadt. Publication 3386. $35 to University of California Press; (800) 777-UC-BOOKS; www.ipm.ucdavis.edu

Camp White-tail

October 14-15
4-H Memorial Camp, Monticello

Do something fun and rewarding with your son or daughter that will help them to gain a greater appreciation of our natural resources and develop an outdoor ethic that will last a lifetime. This year's Camp White-tail is scheduled for the weekend of October 14–15, 2000 at 4-H Memorial Camp, Monticello, Illinois. The previous two years' camps filled to capacity by mid-August, so it is not too early to register.

Camp White-tail is offered to adult/child "teams" who wish to develop the skills necessary to pursue the activities of the Illinois sportsman and to explore career opportunities available in the great outdoors. Topics will include wildlife management, fisheries, forestry, and other related conservation fields. Each adult may attend with up to three youth campers which must be at least 10 years of age. The program is sponsored by University of Illinois Extension, Illinois Department of Natural Resources, Piatt County Ducks Unlimited, National Bowhunter Education Foundation, Illinois Wild Turkey Federation, and the Piatt County Pheasants Forever.

The program will begin at 9 a.m. on Saturday and will end after dinner on Sunday at 6 p.m. A fee of only $38 per person covers the complete program, lodging, and five delicious all-you-can-eat buffet meals. Pre-registration and payment is required and space is limited. Last year's camp was quickly filled to capacity and participants raved about the exciting outdoor skills they learned and the great fun both kids and adults experienced.

All registrations must be received by October 1, 2000 and are taken on a first-come basis. For more information contact 4-H Memorial Camp at ph. (217) 762-2741 or Bob Frazee, Natural Resources Educator at (309) 694-7501.

Addressing Issues of Antibiotics Use in Livestock Production

October 16-17, 2000
Holiday Inn Urbana

An outstanding conference covering the topic of Animal Use in Livestock Production will be held on Monday and Tuesday, October 16 and 17 at the Holiday Inn in Urbana. This conference will bring together some of the most respected and widely known U.S. and international researchers and scholars in the area of antibiotic use.

Three different sessions will be covered during the conference:

- Defining the issue of antibiotic resistance
- Use of antibiotics in livestock production
- Alternative and future use of antibiotics

A few of the international speakers include Dr. Johan Vanhemelrijck, Secretary General FEDESA, Brussels, Belgium; Dr. Wolfgang Witte, Koch Institute, Wernigerode Branch, Wernigerode, Germany; and Dr. Martin Verdstegen, Wageningen Agricultural University, Wageningen, The Netherlands. Besides these three international experts there will be industry, university and governmental specialists from throughout the United States and Canada.

Early registration deadline for this conference will be on September 29 with a registration fee of $180. Late and at door registration will be $220. A copy of the program along with reservations can be made by contacting Dr. Gilbert Hollis, Department of Animal Sciences, University of Illinois at (217) 333-0013.

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Web Sites

Biological Control: A Guide to Natural Enemies in North America, www.nysaes.cornell.edu/ent/biocontrol/

Biological Control as a Component of Sustainable Agriculture, ARS-USDA, Tifton, Ga., http://sacs.cpes.peachnet.edu/lewis

Michigan State University Insect Ecology and Biological Control, www.ent.msu.edu/biocontrol/

Michigan State University's Biological Control Program, www.cips.msu.edu/biocontrol/

Pennsylvania State University IPM, http://paipm.cas.psu.edu

University of California Statewide Integrated Pest Management Project, www.ipm.ucdavis.edu

Illinois Water 2000 Conference

November 13-14
Holiday Inn Urbana

Illinois Water 2000 is an exciting statewide conference for all citizens, groups, and students interested in water resource issues in Illinois. The conference will be held at the Holiday Inn Conference Center in Urbana, Illinois, on November 13-14. Attention will focus on science, technology, and policy developments, while also bringing major water resource organizations and interests together to explore common ground. The Water Resources Center is applying for Certified Crop Applicator Continuing Education approval of the conference.

Conference activities include plenary and technical sessions, guest speakers, and a conference banquet. Specific issues to be addressed include non-point source pollution, water conservation and drought preparedness, urban stormwater, water education, and inland lakes. Registration prior to October 6 is $135 and $160 after October 6. Registrations should be sent to the Illinois Water Resources Center, 1101 West Peabody Drive, Room 350, Urbana, IL 61801.

For more information please contact Fannie Lambert of the Water Resources Center at (217) 333-0536, or Bob Frazee, U of I Natural Resources educator at (309) 694-7501.

Participatory Website Development for Soil Quality Education and Assessment to Improve Agroecosystem Management

The objective of this NCR SARE Professional Development Program Grant is to help farmers, Natural Resource Conservation Service (NRCS) field personnel, crop consultants, and extension staff develop a fuller understanding of soil quality to help achieve their sustainable agriculture goals. The World Wide Web will be uses as the primary dissemination source for this tool because of its ever-increasing importance as an information source. A soil quality website will be developed that is tailored to agricultural professionals in the North Central Region by:

1) asking for meaningful input from our intended audience in a one-and-a half-day work session;

2) educating our website users about soil quality, the sustainability of agroecosystems, and the enhancement of agroecosystems through proper management;

3) providing users with assessment tools to identify management practices that enhance soil quality and agricultural sustainability.

For more information, contact Dr. Michelle Wander at 217/333-9471 or mwander@uiuc.edu.

Publications

Suppliers of Beneficial Organisms in North America. California Department of Pesticide Regulation. A resource for purchasing biological controls as alternatives or supplements to combat insect, mite, snail, or weed pests. Free from the California Department of Pesticide Regulation, (916) 324-4100; brunetti@empm.cdpr.ca.gov

Weeds as Teachers: 'Many Little Hammers' Weed Management. Sally Hilander. Proceedings of a 1995 weed management conference that emphasized least-toxic and non-toxic techniques for controlling weeds in the Northern Plains (Canada and U.S.). Alternative Energy Resources Organization (406) 443-7272, aero@desktop.org

'Naturalize' Your Farming System: A Whole-Farm Approach to Managing Pests, the latest informational bulletin from USDA's Sustainable Agriculture Network (SAN), defines ecologically based systems, outlines ecological principles for managing pests, and suggests how to apply those principles to real-life farm situations. You can view it at http://www.sare.org/farmpest/ or go the publications page from www.sare.org

Pests of the Garden and Small Farm. Mary Louise Flint describes major pests on 30 vegetable and tree fruit crops and alternative controls — biological control, resistant varieties, traps and barriers, and less toxic pesticides. University of California Publication 3332. 286 pages. $35 to ANR Press, (800) 994-8849; http://anrcatalog.ucdavis.edu

The Soil Biology Primer. This set of eight units describes the importance of soil organisms and the soil food web to soil productivity and water and air quality. Free. (888) LANDCARE; landcare@swcs.org; www.statlab.iastate.edu/survey/SQI/catalog.html

Illinois Receives SARE Funding

More than 20 members of the USDA North Central Region Sustainable

Agriculture Research and Education (NCR SARE) Administrative Council gathered in Kansas City, MO, on March 27-29 to award competitive grants and set sustainable agriculture priorities. In attendance was ASAP's, Deborah Cavanaugh-Grant.

The Council meets three times each year to distribute NCR SARE

funds through three competitive grant programs and to set goals and evaluate progress of the NCR SARE program. A Technical Committee also contributes to the Council's decision-making process.

The Council is comprised of farmers, farm educators, agribusiness representatives, nonprofit group leaders, university researchers, state and federal agency representatives and other representatives from each state in the North Central region. Council members are nominated by regional agricultural stakeholders to address local issues.

At the recent meeting, the Council, in addition to other business, approved funding for four Illinois projects:

Two PDP proposals:

John Glover, USDA NRCS • $12,750 (12 months) • Sustainable Approaches to Aquaculture Production and Marketing

Michelle Wander, NRES • $53,771 (24 months) • Participatory Website Development for Soil Quality Education and Assessment to Improve Agroecosystem Management

One Research and Education proposal:

John Masiunas, NRES • $98,590 • Assisting Farmers in Crisis to Adopt Sustainable Marketing Alternatives,

Two Diversity Enhancement Grant Proposals:

Irene Seals, St. Anne, IL • $3,850

Debbie Hudson, St. Anne, IL • $5,250 • Free Range/Pastured Poultry laboratory analysis/demonstration with an organic feed component.

North Central Region Small Farm Workshop

A conference is being planned for local educators, information providers and state small farm teams to:

1) learn about the types and impacts of small farms and the opportunities in working with small farm operators;

2) meet and hear from successful agricultural entrepreneurs;

3) share educational approaches and lessons learned; and

4) develop some coordinated plans for future educational initiatives.

The conference will be held on March 21-23 at the University of Illinois at Springfield. For more information, contact, Deborah Cavanaugh-Grant, 217/968-5512, cavanaughd@mail.aces.uiuc.edu.

ASAP Expands Information Offering

With funding from the Council on Food and Agricultural Research, ASAP researchers are increasing the amount of practical information on the ASAP web site. We've polled Illinois farmers, consumers and others concerned about sustainable agriculture with a single question: "What issues related to the economic environmental and social aspects of food production, distribution and marketing represent the most pressing information needs for Illinois farmers and consumers?" After receiving a wide range of responses, we invited our survey respondents to meet in person to rank and refine their topic recommendations.

The first issue—GMOs—is available at the ASAP website: http://www.aces.uiuc.edu/~asap, click on the icon "Important Issues for Farmers and Consumers."

Look for information on the following topics in the coming months: Farm Direct Sales, Small Farm Survival, Plant Breeding Efforts for Alternative and Specialty Crops, Reducing Agriculture's Impact on Water Quality, Alternative Crop Production Information, , Curbing Urban Sprawl, Consumer Health Risks, Using Best Management Practices, New Nutrition Research, the Quality and Safety of the Food Supply, Determining Forces of Agricultural Production, the Effects of Mergers and Concentration on Agriculture, Value-Added Opportunities for Farmers and Communities, and Ways to Improve Irrigation Efficiency.

North Central SARE Calls for Innovative Agricultural Grant Proposals

The USDA's North Central Region (NCR) Sustainable Agriculture Research and Education (SARE) program is calling for collaborative teams of researchers, educators, farmers, and others to apply for competitive grants to study or educate others about environmentally benign agricultural systems that are profitable and supportive of local communities

About $1.3 million will be available in 2001 to fund creative projects addressing long-term enhancement of food and fiber systems in the 12-state region.

"As farmers feel the crunch of low prices and limited markets sustainable agricultural offer answers," said Ben Bartlett, agricultural systems, NCR SARE Administrative Council chair from Michigan State University.

Details of this annual research and education initiative are outlined in a July 14 Call for Preproposals, emphasizing potential impact and outcomes of 2001 projects.

The NCR SARE program also encourages preproposals that include holistic approaches, involvement of interdisciplinary teams, meaningful participation of farmers and ranchers, significant outreach, and an eye for measurable results.

Application materials are available by contacting the NCR SARE office at (402) 472-7081, (402) 472-0280 (fax), or ncrsare@unl.edu. The Call for Preproposals can be found at www.sare.org/ncrsare. Preproposals are due on September 8, 2000. The Administrative Council will invite project coordinators to develop preproposals into full proposals in December 2000. Selected full proposals will be recommended for funding in May 2001, and funds will be available in the fall of 2001 to begin project work.

Applicants must reside in the North Central Region: Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota, and Wisconsin.

The Research and Education Grant Program was first funded by Congress in 1988; more than 250 research and education grants have been awarded in the North Central region since, worth more than $14 million. See www.sare.org to search the national SARE database of funded projects from across the country.

For more information, contact Deborah Cavanaugh-Grant, NCR SARE Administrative Council member from Illinois, (217) 968-5512 or cavabaughd2mail.aces.uiuc.edu.

AGRO-ECOLOGY
News and Perspectives

University of Illinois at Urbana-Champaign
College of Agricultural, Consumer and Environmental Sciences
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News and Perspectives

AGRO-ECOLOGY

Science and Education for a Sustainable Agriculture

Volume 9 • Number 4

Branding Increases Sales, Stability for Small and Mid-sized Livestock Farms

Richard Knipe and Dar Knipe

As agriculture trends toward fewer and larger farms, nowhere is the impact of this consolidation greater than on mid-sized farms. They comprise the majority of the thousands of farms lost in Illinois each year. Many of the hardest hit are those producing livestock. In turn, losses in the livestock industry contribute to the de-stablizing of agriculture as a whole by further reducing corn and soybean demand.

Believing that not all small- and mid-sized farmers need become casualties of consolidation, a group of University of Illinois Extension professionals, faculty, and industry representatives organized a working group to address this issue. Backed with funding from the Illinois Council on Food and Agricultural Research (C-FAR), they developed a project they hoped would offer practical solutions.

Their project, *Creation of a Branded Product in a Commoditized Industry*, chose lamb as a model because Illinois' sheep industry represented a worst case scenario of an agricultural sector that had not been able to move from a commoditized industry to a customer-driven segmented industry. Demand for lamb in the United States has been in a free fall since 1962 when per capita consumption peaked at 4.5 pounds. Today, the average U.S. consumer eats less than one pound of lamb per year. Compounding the problems of U.S. producers, was the fact that New Zealand imports have captured a growing share of their dwindling market.

In spite of what appeared to be fairly dismal conditions, the research group recognized that Illinois farmers have several inherent

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Heartland lamb products displayed in a supermarket in Sycamore, IL.

FALL 2000

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Chuck Caveness, Sycamore sheep producer, measuring the loin eye area and fat thickness on a lamb cut.

Agro-Ecology News and Perspectives is published by the College of Agricultural, Consumer and Environmental Sciences, Agroecology/Sustainable Agriculture Program, University of Illinois at Urbana-Champaign (UIUC). This newsletter is designed to inform its readers about the well being of human and natural communities through the adoption of agricultural practices and farming systems that are economically viable, environmentally sound, and socially just. This issue was edited by Deborah Cavanaugh-Grant and Anna Barnes and designed and produced by Scherer Communications.

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If you would like to receive future issues of Agro-Ecology News and Perspectives, contact Deborah Cavanaugh-Grant, (217) 968-5512, e-mail: cavanaughd@mail.aces.uiuc.edu.

Branding, continued

advantages over their larger, more commodity-minded competitors. Illinois farmers can produce a discernibly higher quality product by virtue of genetics and nutrition. This is because the climate of the Upper Midwest is well suited for breeds that rate high in flavor and tenderness. Producers also have access to local, abundant, and relatively cheap corn and soybean meal supplies which are key for raising high-end meat products. Additionally, they have proximity to viable markets.

A review of existing studies suggested that income and ethnicity are the two largest determinants of propensity to consume lamb. Chicago combines both of these. The communities of northern Cook and the surrounding collar counties have the highest per capita income in the state. Chicago also is the fourth most popular U.S. destination for immigrants. Its immigrant populations are clustered in neighborhoods throughout the greater metropolitan area, making them an accessible customer base.

The group joined forces with Chuck Caveness, a sheep producer from Sycamore, Illinois, in the Chicago collar area. Caveness had an interest in creating a branded lamb product and was already selling freezer-lamb. He agreed to supply lamb which would meet the specifications identified by the group and to work with the group to develop an appropriate marketing strategy that capitalized on the advantages afforded livestock producers in Illinois and the Upper Midwest.

They then targeted retail outlets in Skokie and in Mount Prospect, Illinois. Both were independent grocery stores whose customers were both ethnic and had higher than average per capita incomes. Independent grocery stores were selected because they were more likely to compete on the basis of quality and service rather than price, making them a more logical outlet for a high-end branded product.

Using a survey developed by U of I associate professor of business administration, Brian Wanzink, the group polled 218 customers to determine their receptiveness to a branded lamb alternative. The researchers wanted to discover the characteristics consumers would value most in a meat product and to

Lambs of the type being produced by Chuck Caveness, Sycamore, IL.

Meat manager of a local supermarket in Sycamore and Chuck Caveness promote the Heartland brand of lamb.

develop a profile of market segments where branded products would have the most growth potential.

In evaluating the survey responses, the researchers divided consumers into three groups based upon the frequency of their lamb purchases: non-users, light users (1 to 52 purchases per year), and heavy users (greater than 52 purchases annually). These made up 10.1 percent, 75.2 percent, and 14.7 percent of the surveys respectively. Heavy users significantly reflected their ethnicity in dinner meals, including lamb in more than 40 percent of them. Light users averaged 20.7 lamb purchases per year. Improved price, taste, and less fat were important factors in increasing their lamb purchases. However, taste was the most frequently cited purchase factor among all groups. Demographics were similar among all user types. And, consumers indicated that they would pay approximately 10 percent more for a consistently high quality product. From the survey data, the group decided that they should target light users who represented the highest potential for increased purchases.

As a result of consumer feedback, the researchers developed the following specifications: lambs must be younger than 10 months of age and spend a minimum of 45 to 60 days on a high-energy, corn-based diet. Rations should include vitamin E supplementation to extend shelf life, however no antibiotics or hormones should be used. The branded product should not included intact males or Callipyge lambs. Carcass weights should range between 60 and 80 pounds, with a maximum of .1 to .2 inches of fat depth at the twelfth rib. Additionally, ribeye area should be at least 2.5 square inches.

Using these specifications, Caveness introduced his lamb under the trademarked name Heartland Lamb in February of 1999. The lamb is currently being offered at a 10 percent premium in retail stores and high-end restaurants in the Chicago metropolitan area. Lamb sales have grown from an initial two lambs per week at the beginning of the project to a current rate of 40 lambs per week. Ongoing sales data collection indicates that sales of the guaranteed high-quality branded lamb products increase overall lamb sales without cannibalizing generic lamb sales.

From its experience with branded lamb, the research group developed several guidelines for producers and producer alliances contemplating branded products. These are applicable to sheep producers, as well as other livestock producers in Illinois and the Upper Midwest:

■ **Choose Your Customers** Identify the customers who have the highest propensity to consume your meat products. Understand where they buy and what influences their choice.

■ **Set Standards for Quality and Stick with Them** If quality is to be your competitive edge, set clear standards for evaluating quality and enforce them. Don't be tempted to relax standards when the product demand exceeds supply.

■ **Cultivate strong relationships with retail outlets** Relationship marketing has not been greatly exploited in the meat industry. One retailer commented that, unlike other product lines in the store, his meat orders are mainly serviced over the phone. No one offers that face-to-face added level of service.

■ **Start small** The learning curve for ventures of this nature can be steep. Early attempts at direct marketing should be on manageable scale. Customers lost during early, mistake-prone stages of development may be difficult to win back .

■ **Focus on improving on-farm practices that affect quality** This project and others like it reflect the importance employing genetics and management practices that influence the eating quality of meat.

Branded products are a cause for optimism for Illinois producers. The results of this study show that a consistently high-quality product can increase demand and garner a premium price for producers. The success of these products depends upon a producer's ability to create a clear and distinct difference between his or her product and its commodity alternative, as well as a thorough understanding of the consumers who will be most likely to buy the product.

Richard Knipe is a University of Illinois animal systems (beef) extension educator and Dar Knipe is a University of Illinois small business management extension educator. Both educators are located at the Quad Cities Center in East Moline, Illinois.

Niche Livestock Marketing in Illinois: Overcoming Hurdles to Higher Profits

Juli Brussell

With commodity prices on a roller coaster since 1998, it's not surprising that farm profits have taken a beating. Maintaining financial solvency in the face of rock-bottom hog and soybean prices has sent some farmers in search of off-farm employment, while others have called it quits altogether.

That said, margins for specialty products, including organic and sustainably raised meats and other livestock items, remain solid. Further, consumer demand for these so-called niche products is increasing by 25 to 30 percent a year.

Many of these products command a higher premium, which affords farmers who are willing to try something new a means of increasing revenue. Naturally or humanely raised pork, organic and/or grass-fed beef, pastured poultry, organic milk, and free-range farm eggs are being sought by many urban consumers who are willing to pay, and pay well for these products.

Some farmers, such as those in the Pembroke Organic Farmers Cooperative near Monmouth in Warren County are looking for ways to work together to bring these products to customers (see *Agro-Ecology News and Perspectives* vol. 8, no. 3).

Others, such as Paul Gebhart of Edinburg and Stan Schuette of Stewardson, individually market their meats through a variety of venues.

Gebhart sells a portion of his organic hogs through Niman Ranch, a California-based company that purchases humanely raised pork from midwestern farmers. However, Gebhart relies on relational marketing to sell the majority of his hogs. He develops on-going relationships with his customers, selling most of his pastured chickens, eggs, turkeys, and grass-fed beef this way, as well. Gebhart also raises most of his feed, which keeps his production costs to a minimum and allows him to retain most of the profit from his premium products.

Schuette follows a similar production and marketing plan. He sells some of his pastured chickens to local restaurants and individual customers, and is slowly expanding his operation to include eggs and pork. Schuette currently purchases some of his feed from area farmers, but hopes to increase the amount of feed and forage he produces.

A recent study investigated the prevalence of processing facilities for handling the specialty livestock products of Illinois farmers. It was conducted as part of a Specialty Livestock component of the Value Project, which is funded through the Illinois Council on Food and Agriculture Research's Strategic Research Initiative.

One of the results of this research is the production of *The Small and Mid-size Livestock Processing Directory*. This directory features information collected from facility owners and managers in a late-1999 telephone survey. This information includes: the facilities' processing capacity, the portion of its business devoted to custom processing, the types of animals processed, and any specialty products or processes offered. It also offers owner/manager perceptions of business trends and the impact of federally mandated Hazard Analysis and Critical Control Point (HACCP) plans on smaller facilities.

As of January 2000, all state and federal inspected processing plants were required to develop HACCP plans. These plans identify and maintain a written log that checks off every point in a processing procedure where contamination may occur. In the survey, many managers and owners of smaller processing facilities with few employees noted that maintaining the paperwork necessary for the HACCP logs was overly burdensome. Some operations chose to close their doors or change their status to that of an uninspected plant and no longer process meat for resale.

Though aimed at increasing food safety, the HACCP mandate resulted in the loss of a number of smaller livestock processing facilities in Illinois. Large-scale facilities tend to operate as dedicated plants for wholesale slaughter and typically do not offer custom processing. Unfortunately, this loss comes at a time when farmers are beginning to develop alternative livestock enterprises with greater profit potential. The survey determined that farmers in some areas might not be able to resell meat to their customers because of a lack of nearby custom processing facilities.

Illinois farmers often experience great difficulty finding locations where they can have their poultry processed. And though federal on-farm exemption guidelines permit farmers to slaughter up to 20,000 birds or rabbits a year on their own farm for sale directly consumers, Illinois law currently permits only 5,000 birds or rabbits to be processed on-farm. Additionally, the Illinois Department of Agriculture has taken a more restrictive stance than neighboring states regarding the on-farm facilities that farmers must construct to qualify for this exemption. This restrictive stance, coupled with the very limited number of state inspected facilities offering custom poultry processing, makes it difficult for Illinois farmers to take advantage of a lucrative product that can literally sell itself.

Another research project begun in the fall of 2000 stands to increase the number of smaller farmers engaged in niche livestock production and the production of other high value crops. With funding from the North Central Region Sustainable Agriculture Research and Education Program (SARE), U of I researchers are working closely with the Illinois Small Farm Task Force to identify diversification options for smaller farmers. They will provide business planning and training in conjunction with community colleges in several locations, and ultimately link a number of farmers with mentors for enterprises such as pastured poultry or aquaculture.

Diversification strategies such as niche livestock products offer some Illinois farmers a way to combat falling commodity prices and keep more profit on the farm. However, these opportunities are not without obstacles, as highlighted by the processing issue. By addressing barriers, current research will help farmers, such as Gebhart, Schuette, and the members of the Pembroke Cooperative, find easier ways to service their customers with these high-value products, and pave the way for other Illinois farmers to stabilize their incomes through diversification.

For free copies of *The Small and Mid-size Livestock Processing Directory* and *Specialty Livestock Processing Research Report* write to the Department of Agricultural and Consumer Economics, Attn. Burton Swanson, 412 Mumford Hall, 1301 W. Gregory; Urbana, IL 61801, email swansonb@uiuc.edu, or telephone (217) 244-6978.

Juli Brussell coordinates the U of I's Small Farm Enterprise project and serves on the Illinois Small-Farm Task Force. She helped author The Small and Mid-size Livestock Processing Directory and Specialty Livestock Processing Research Report.

Federal SARE Funding Enjoys 2001 Increase

The Sustainable Agriculture Working Group's electronic newsletter reported good news for sustainable agriculture in the FY2001 federal appropriations. SARE advocates were looking and working for a substantial funding increase. No other federal ag program does as good a job serving the real needs of farmers, consumers and the environment. A capsule summary for research and education is as follows...

- Sustainable Agriculture Research and Education funding went up 15 percent to a combined $13.1 million ($9.3 million for Chapter 1 and $3.8 million for Chapter 3).
- A new program was initiated for organic farming transition research with limited start-up funds of $0.5 million.
- ATTRA funding increased a third to $2 million.
- Funding for the Wisconsin-based integrated farming systems research work increased by 60 percent to $0.8 million, and small increases were made elsewhere in the Agricultural Research Service (ARS) budget for organic research and small farm work.

By way of comparison, the overall ARS budget increased 8 percent, and the overall cooperative state research budget increased 5 percent, though nearly all of the increases were in congressionally-targeted earmarks or special grants (43 percent increase). Formula funds were level funded, as were competitive and formula funds for IPM. The National Research Initiative was cut 11 percent, and Section 406 integrated programs and special Extension programs as a whole both increased a mere 1 percent. So in terms of broad national programs, our targeted programs fared well indeed.

Intensive Grazing Catching on in Illinois

A visit to the Jim Burrus farm near Jacksonville provided Training School participants with a first-hand view of the benefits of management intensive grazing.

Management intensive grazing involves the orderly grazing and resting of grassland. In this system, one herd of livestock grazes eight or more pastures in a planned sequence. Livestock are moved into one pasture while the other pastures are rested. When the forage is grazed to the desired density, livestock are moved to the next pasture in the rotation. During the peak of growing season, livestock are moved rapidly—every three to five days. As pasture growth rates slow, so does the movement of livestock. A grazing cycle is completed every 25 to 35 days depending on forage species and time of season.

According to University of Illinois extension educator Ed Ballard, intensive management grazing is an excellent tool for helping farmers maximize land resources. Plus, these systems can be tailored to suit single or multiple species of livestock.

Recently, Ballard along with other U of I Extension, USDA Natural Resources Conservation Service, Soil and Water Conservation Districts personnel, and area graziers participated in an Advanced Grazing Training School held in Springfield. The focus of the two-day workshop was to provide in-depth information on managing intensive grazing systems.

The workshop included discussions of multi-species grazing, fertility management, extending grazing seasons, supplementation for livestock on pasture, health systems for grazing animals, pasture renovation, water systems, fencing systems, grazing standing crops, and grazing finances.

Sponsored by U of I Extension, Great Lakes Grazing Network, USDA Natural Resources Conservation Service, and the North Central Region Sustainable Agriculture Research and Education (SARE) program, the workshop drew presenters and participants from Illinois, Michigan, and Ohio. It also featured presentations from Illinois graziers John Hebert, a beef stocker from Owaneco, and Dave Surprenant, a dairy producer from Manteno, as well as a visit to the Jacksonville-based beef operation of Jim Burrus.

For more information on management intensive grazing, see the following resources.

- Coming soon, the *Illinois Grazing Manual*. For more information, contact Ed Ballard at (217) 347-5126 or ballarde@mail.aces.uiuc.edu

- "Measuring Quantity and Quality of Forages Available for Grazing in Illinois." The purpose of this project is to determine "base line" figures for quantity of various forage species available for grazing in Illinois and to record differences in quality of those species during the grazing season. Secondly, it is the intent of this project to increase the producer's ability to know: (1) the amount of forage available for grazing and (2) the degree of change, if any, in the quality of that forage over the grazing season.

  "Sustainable Beef Production-Managmentment Intensive grazing vs. Corn Silage Program for Beef Stocker Calves." This research/demonstration project focuses on the environmental, economical and production benefits of management intensive grazing (MIG) and corn silage systems for beef stocker calves. The study evaluate the costs and returns from MIG systems versus a corn silage program for beef stocker calves. The MIG involves two phases of grazing, (1) a summer-time program of alfalfa-Orchardgrass pasture and (2) a late-winter through early spring grazing of cereal grain rye forage planted on crop acres.

  Information about both of these projects is available on the IDOA C-2000 Sustainable Agriculture Research and Education Grant Program website-http://www.aces.uiuc.edu/~C2000/fy98/index.html

- American Farmland Trust's new information site on grass-based farming systems features a variety of topics related to grazing and grass farming at http://grassfarmer.com/

- If your business is turning grass into beef, lamb or milk, you'll want to check out *The Stockman Grass Farmer*, a publication devoted entirely to the art and science of turning grass into cash flow. The publication features the latest in intensive grazing technology and pasture management. To receive a free sample issue, call (800)748-9808, or fill out the brief online form at http://www.stockmangrassfarmer.com

- Rotational Grazing—Livestock Systems Guide (http://www.attra.org/attra-pub/rotategr.html). Appropriate Technology Transfer for Rural Areas (ATTRA), P.O. Box 3657, Fayetteville, AR 72702, Phone: (800)346-9140; FAX: (501) 442-9842.

- Also see "Wisconsin Offers School for Beginning Dairy Farmers" conference on page 11.

RESOURCES

Development of a Code of Practice for Prudent Use of Antimicrobials in Livestock Production

This is a report from the World Health Organization, is available at http://www.oit.doe.gov/agriculture on the Internet.

The Small Dairy Resource Book

Dairy farmers will find this new 56-page annotated bibliography of books, periodicals, videos, and other materials on farmstead dairy processing a valuable resource. Intended for farmers and others interested in adding value to dairy products, it includes resources for on-farm cheesemaking, ice cream, butter, dairy processing, raising dairy animals, business and marketing, food safety, feeds, and grazing. An ideal resource for extension agents and other agricultural educators, this book also can save producers hours of searching. To order, visit http://www.sare.org/san/htdocs/pubs/ or send $8 plus $3.95 shipping and handling to Sustainable Agriculture Publications, Hills Building, Room 12, University of Vermont; Burlington, VT 05405-0082. For Visa and Master Card orders, call (802) 656-0484. Bulk discounts are available for orders of 10 or more copies.

Free-range v. Confinement

Interested in seeing how free-range systems stack up to confinement livestock operations? Then visit http://eatwild.com on the Internet. The "News" section contains references to dozens of published studies showing the benefits of free-range management to animal health, the environment, and consumers.

Grant Writing Workshops Offered at Five Sites

Illinois producers and agriculture professionals can find out how to write grant proposals for two sustainable agriculture programs—North Central Region Sustainable Agriculture Research and Education (NCR SARE) Producer Grant Program and the Illinois Department of Agriculture's Conservation 2000 Sustainable Agriculture Program (C-2000)—at free workshops in February.

The workshops will include information to help farmers compete for grants from the NCR SARE Producer Grant Program. Producers interested in research, demonstrations, or educating others about profitable, environmentally sound, socially responsible agricultural are encouraged to apply.

"The Producer Grant Program emphasizes the importance of farmer-driven research and indigenous knowledge," says Ken Schneider, NCR SARE's producer grant liaison. "We support innovative farmers and ranchers looking for ways to overcome obstacles to a sustainable option."

In 2001, grants will be awarded to individual producers in amounts up to $5,000. Projects involving multiple producers can be funded up to a maximum of $15,000. Funds will be made available to successful applicants during the fall of 2001.

February 7	University of Illinois Extension, Monroe County 901 Illinois Ave., Waterloo
February 13	University of Illinois Extension, Coles County County Fairgrounds, Charleston
February 15	University of Illinois Extension Springfield Extension Center Illini Auditorium, Illinois State Fairgrounds, Springfield
February 19	University of Illinois Extension, Grundy County Grundy County Farm Bureau 4000 North Division St. (Rt.47), Morris
February 22	University of Illinois Extension, Bureau County 850 Thompson St. , Princeton

This year's workshops also will include information about the Illinois Department of Agriculture's C-2000 Sustainable Agriculture Grant Program. This program provides funds to agencies, organizations, and individuals for on-farm research and demonstrations, outreach and education programs, and integrated farming systems research.

The workshops will be conducted by the University of Illinois Agroecology/Sustainable Agriculture Program (ASAP). ASAP staff will explain objectives and requirements to receive funding for both programs. A SARE producer grant recipient will be at each workshop program to relate the farmer experience in the NCR SARE Producer Grant Program. Facilitators will be available for individual assistance. All workshops will be conducted from 10 a.m. to noon on the dates and at the locations shown above.

For more information, see http://www.sare.org/ncrsare/ on the Internet. Alternatively, contact Deborah Cavanaugh-Grant at cavanaughd@mail.aces.uiuc.edu or at (217) 968-5512.

Smithsonian Exhibit Features Innovative Illinois Farmer

'Listening to the Prairie' Depicts Productivity, Mystery of the Grasslands

Grain and livestock farmer Joel Rissman is one of four producers featured in a multi-panel exhibition about the North American prairie that opened at the Smithsonian National Museum of Natural History in Washington, D.C., on Nov. 18. Information about Rissman's innovative, 370-acre farm, emblazoned on tall panels featuring dramatic color photos, is woven throughout the exhibit, 'Listening to the Prairie: Farming in Nature's Image.'

Rissman and his wife, Adela, were flown to Washington, D.C., and were introduced by Secretary of Agriculture Dan Glickman to a crowd of 100 attending an exhibit preview event.

The exhibit about the prairie—from its unique mix of flora and fauna to its huge agricultural output—describes the evolution of the vast grasslands region as well as the progressive prairie farmers and ranchers who have found innovative new ways to earn profits in sync with their sensitive environment and in tune with the needs of their communities.

"The prairies are the heart of America's breadbasket, producing much of the nation's corn, wheat and soybeans," said Secretary of Agriculture Dan Glickman, himself from the prairie state of Kansas. "I hope this exhibit helps Americans better understand the vital contribution this region and its people make to the high quality of life we can all enjoy together."

Years ago, Rissman decided to integrate his crop and livestock systems to reduce production costs and improve profits. Raising 250 head of cattle and small flocks of chickens provides a steady source of manure, 80 percent of which Rissman composts and uses as fertilizer for organic grain crops. Thanks in part to a USDA sustainable agriculture grant, Joel now spends less than half to produce compost than he did to buy fertilizers.

That fertile compost nourishes a variety of organic crops—corn, soybeans, oats, wheat, barley, sorghum, flax, and alfalfa mixed with grasses for hay—which the Rissmans feed to their animals. They also sell organic soybeans and corn to organic wholesalers, gaining a premium as much as four times over conventional soybeans and about two times greater than conventional corn. They sell their cattle as "organically fed"—meaning the meat is produced with all organic feeds and supplements, with no chemicals or drugs—directly to consumers from the farm.

"Most of my resources come from within the system," Rissman says. "I'm enhancing what's on the farm because I want to take what's good here and make it even better."

The Smithsonian exhibit focuses on the prairie ecosystem as well as its role in creating the "breadbasket" region that supplies much of the U.S.—and the world—with commodities like corn, soybeans, wheat and livestock. The prairie remains home to many one-of-a-kind plants and animals. Many waterfowl depend on prairie grasslands for breeding and wintering during migration. Native prairie flowers attract monarch butterflies, one of only a few butterflies that migrate thousands of miles, and prairie herbs hold potential as remedies for common disorders. Prairie grass that once fed bison is now grown as livestock forage and to make renewable fuels.

'Listening to the Prairie' was partially funded by USDA's Sustainable Agriculture Research and Education (SARE) program. Since 1988, SARE has advanced farming systems that are profitable, environmentally sound and good for communities through a nationwide grants program. Rissman has received two producer grants from SARE's North Central Region in 1994 and 1999. For more information about how to apply for a grant, call (402) 472-7081 or go to www.sare.org/ncrsare

'Listening to the Prairie,' will run from now through March 2001 at the Smithsonian Natural History Museum. Beginning in April, the exhibit will travel to 20 libraries throughout the U.S. as part of a tour sponsored by the American Library Association. For more information, contact ALA at (800) 545-2433, ext. 5054.

RESOURCES

StarLink Update Available on ASAP Web-Site

StarLink is the now-famous GMO corn hybrid that was approved by the U.S. Environmental Protection Agency for animal use only. Controversy arose when it was shown that this hybrid had found its way into food for human consumption both in the US and abroad.

ASAP offers the latest information on this developing story in the Important Issues for Farmers and Consumers section of our web-site. Go there now for more information...

http://www.aces.uiuc.edu/~asap/expanded/gmo/starlink.html

Farm Conservation Programs Telenet Set for Thursday, January 25

With commodity prices below break-even levels, agricultural landowners and producers are re-examining their farming decisions, especially row-crop production on environmentally sensitive lands. Many are calling their natural resources agencies and extension offices for advice about state and federal conservation programs. For instance, will it be more cost-effective for landowners to take land out of continuous row-crop production and enroll it in one of the many state/federal conservation programs? Depending upon the soil type and the conservation practice being installed, many conservation programs are paying as much as $150 to $185 per acre annually for enrollment.

To help landowners and producers evaluate their options, a statewide Farm Conservation Programs Telenet has been scheduled from 9 a.m. to 12 noon on Thursday, January 25 at participating local University of Illinois Extension Unit Offices.

The purpose of the Farm Conservation Programs Telenet is to educate extension and agency staff, and landowners about basic provisions, economic incentives, cost-share rates, technical support, ranking criteria, and signup periods of the following programs:

- The Conservation Reserve Program (CRP)
- Environmental Quality Incentives Program (EQIP)
- Wetland Reserve
- Wildlife Habitat Incentives Program (WHIP)
- Illinois Rivers 2020
- Illinois Buffer Strip Initiative
- Conservation Reserve Enhancement Program (CREP)
- Illinois' Conservation 2000 Agriculture Resource Enhancements

Experts will be on-line to answer questions.

This program is being sponsored by University of Illinois Extension in cooperation with the Natural Resources Conservation Service (NRCS), Farm Services Agency (FSA), Illinois Department of Agriculture (IDA), Illinois Department of Natural Resources (IDNR), Illinois Environmental Protection Agency (IEPA), Illinois Council for Food and Agricultural Research (CFAR), and the Association of Soil and Water Conservation Districts (AISWCD).

Preregistration is necessary given space limitations and the need to distribute information packets prior to the Telenet. Register by contacting your local U of I Extension Office.

January

January 17-18, **Illinois Specialty Crop Conference**, Clarion Hotel and Convention Center, Champaign, IL. For more information, contact Bill Shoemaker at (630) 584-7254 or e-mail Bill at wshoemak@inil.com

January 27, **Illinois Sheep Industry Conference**, 9:30 a.m. - 3:15 p.m. Sheep Science Laboratory, Room 105 Animal Sciences Laboratory, Urbana. To register contact Dick Cobb, Sheep Extension Specialist, (217) 333-7351.

February

February 1, **Stateline Fruit & Vegetable Conference**, McHenry Co. Extension Unit, (815) 338-4747 or at McHenry_co@mail.aces.uiuc.edu

February 5, **Pasture Management and Grazing Workshop**, Henry, IL. For details contact Marshall-Putnam County Extension Office at (309) 364-2356.

February 13, **Small Tract Workshop**, Loveland Community House, Dixon, IL. For details contact Lee County Extension Office at (815) 857-3525.

February 14, **Value Added Crops Conference**, Kankakee Co. Extension Unit at (815) 933-8337.

March

March 4-7, **TMDL Science Issues Conference 2001**, St. Louis Convention Center and Adam Mark Hotel, St. Louis, Missouri

The Water Environment Federation and the Association of State and Interstate Water Pollution Control Administrators (WEFA/ASIWPCA) TMDL Science Issues Conference is your opportunity to hear from experts on the science of pollutant management using a watershed approach. The conference is intended to help identify and clarify what science tools and information are available or needed to assist state, tribal, and local organizations in listing impaired waters, developing effective TMDL plans, and implementing TMDLs.

Many TMDL meetings to date have focused on the regulatory and political issues surrounding TMDLs.

The science focus envisioned for this conference is a logical and needed effort. This results oriented program will bring you and your colleagues together to assess the current body of science and identify areas where additional tools and information are needed. For more information call (703) 684-2423. Send e-mail to sthomas@wef.org., or see http://www.wef.org/GovtAffairs

Wisconsin Offers School for Beginning Dairy Farmers

Do you want to manage your dairy herd in a way that can: cut costs and increase profits? or provide you with a better quality of life while enhancing the environment? Grass-based dairying may be the answer. The University of Wisconsin is currently offering a one-year certificate program in grass-based dairying through the Wisconsin School for Beginning Dairy Farmers. The course provides opportunities for internships, mentoring, farm tours, and networking with experienced grass-based dairy farmers. Participants, also can learn about grazing sheep, goats, and other species. Specialized scholarship support and a distance education option are available. The school is part of the UW-Madison Farm and Industry Short Course, and receives support from the Center for Integrated Agricultural Systems. For more information, contact Dick Cates at rlcates@facstaff.wisc.edu, or for an application or brochure, contact Kathy Martin-Taylor by email at kmartint@facstaff.wisc.edu. Alternatively, write to UW-Madison Center for Integrated Agricultural Systems, 1450 Linden Drive; Madison, WI 53706, or telephone (608) 262-5200.

Farmers' Direct Marketing Conference and Trade Show Set for Mid-January

"Diversity in the Desert" is the theme for the 16th Annual North American Farmers' Direct Marketing Conference and Show to be held in Mesa, AZ, from January 15 through 22. Conference activities will include workshops, educational sessions, and a trade show, as well as, tours of Arizona farms and tourist sites. Program and registration information are at http://www.familyfarms.com on the Internet. Keynote speaker will be Dr Kevin Leman, a widely acclaimed family psychologist. Session and workshop topics will include entertainment farming to create educational memories of farm and ranch visits, creative and effective community markets to serve the vendor and customer, nursery and greenhouse retailing, e-commerce expansion, and food safety issues. For more information, contact Charlie Touchette, Executive Director, North American Farmers' Direct Marketing Association at nafdma@map.com or call (888) 884-9270.

Small Farm Regional Workshop March 21-23

"Small Farms—A Renewed Opportunity" will be the theme of the North Central Region Small Farm Workshop (NCRSFW), March 21–23, on the University of Illinois-Springfield campus. Agricultural information providers, local educators, and state small farm teams throughout the north central states will gather to gain knowledge and network on how to best supply small farmers with resources.

Events include an opening reception featuring locally produced food. Also on the agenda are speakers presenting innovative approaches for small farms and small farm operators presenting their success stories and lessons learned.

This event will build upon the recommendations of the National Commission on Small Farms and the foundation laid by the 1999. National Small Farm Conference. It will address the status and contributions of small farms and help those in attendance gain insight from agricultural entrepreneurs on how to be successful. Participants will have opportunities to interact and learn from one another and form cooperative plans for future small farm education, such as multi-state programming efforts.

Workshop agenda and registration information are available at http://www.aces.uiuc.edu/~asap/smallfarm on the Internet. Limited funds are available for registration, lodging, and transportation for interested educators. Contact Deborah Cavanaugh-Grant at cavanaughd@mail.aces.uiuc.edu, or call (217) 968-5512 for more information.

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Science and Education for a Sustainable Agriculture

Volume 10 • Number 1

Hemp: Illinois' Third Crop?

SPRING 2001

by Debra Levey Larson

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Some farmers believe that adding industrial hemp to their two-crop rotation would be good for their land and their wallets. Unfortunately, although hemp cannot induce the euphoria of marijuana, the two plants are legislatively linked together as illegal.

The Differences Between Marijuana & Industrial Hemp

Marijuana and industrial hemp are both classified as *Cannabis sativa*. As small plants, they look similar, but when mature, they are completely different. Ned Behrensmeyer, a farmer in Payson, Illinois who is lobbying to allow industrial hemp to be a viable crop gets frustrated when people refer to hemp and marijuana as "cousins." He explained, "Marijuana and hemp are different varieties of the same species. It's like different breeds of dogs. Dogs and wolves are taxonomic cousins. Gorillas and Chimps are ours. People of different races are not 'cousins' and neither are hemp and marijuana."

More important is that the psychoactive properties of the two plants are completely different. The leaves and flowers of marijuana contain the psychoactive ingredient delta-9 tetrahydrocannabinol, popularly called THC. Marijuana contains from 5% to 20% THC by weight. Industrial hemp has less than 1% THC by weight, making it totally ineffective as a drug. Industrial hemp also contains a high percentage (10 to 20 times in all plant parts) of cannabidiol, or CBD which actually blocks a marijuana high.

Behrensmeyer believes that poppies we are the best comparison to the relationship between hemp and marijuana plants. *Papaver somniferum* is the species name for

continued on next page

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the group of plants which includes the ornamental poppy, the breadseed poppy (which gives us poppy seeds) and the opium poppy from which morphine is made. The breadseed and ornamental poppies were bred to have less than 100th of a percent of opium in the dry seed pod. Behrensmeyer said, "No one confuses breadseed and ornamental poppies with opium poppies. You don't go into a bakery and say, 'Can I have an opium bagel?' We have come to understand that there is a tremendous difference in these three plant varieties of the same species."

Because of the completely different ways that hemp and marijuana are grown, Behrensmeyer insists that there would be no confusion in the field as to which is which. "Hemp is harvested when it pollinates, i.e. right after it flowers. The word 'sinsemilla' is the word for high grade pot. The word is Spanish for 'without' (sin) 'seed' (semilla). This provides a very important clue for understanding why growing hemp and marijuana together is absurd. Cannabis is dioecious, there are male and female plants. The whole technique for boosting the THC levels in marijuana varieties involves removing the male plants and bringing the female plants to full maturity in the complete absence of pollen. The female plant produces an abundance of THC-rich sticky resin in the desperate attempt to grab any stray pollen grain in the atmosphere. The THC levels plummet as soon as the females are pollinated. The intensely pollen rich environment of a hemp field would be the worst possible place to try and raise high grade marijuana."

The History of Hemp

Early American settlers grew industrial hemp. It was used for a wide variety of products including ship's sails. The word "canvas" comes from word "cannabis." Betsy Ross even used hemp in the material she used to make the first United States flag. But in 1937, Congress enacted a ban on marijuana that came to encompass hemp as well. During World War II, imports of Manila hemp from the Philippines were cut off, so the government distributed seeds for U.S. farmers to grow it temporarily.

Products made from hemp are biodegradable. The fibers can be made into a kind of particle board, plastics, fuel, oil, paper, even foods such as birdseed, granola bars and cereal.

Because transporting large bales of hemp is difficult, it was necessary to have mills near the fields. So, between 1942 and 1944 there were 42 mills in the Midwest, 11 of which were in Illinois. They were situated within about 12 miles of the fields, in areas with at least 10,000 acres of available farmland.

Once the war ended, hemp was banned again. And by that time, synthetic fibers like nylon were taking its place. All of our native varieties of hemp have been lost. But there is a variety called ditch weed which is still thriving along roadsides, although it has not been shown yet whether ditch weed has

retained the favorable traits of hemp such as fiber to hurd ratio.

Today, hemp continues to be grown and processed in about 32 countries around the world, including France, Italy, England, Hungary, The Ukraine and Canada. In 1999 Canada planted 35,000 acres. Last year, Canada approved 23 varieties which were certified to be at a level of .3% THC. The United States imports hemp from other countries. For instance, textile grade hemp comes from China.

The fibers can be made into a kind of particle board, plastics, fuel, oil, paper, even foods such as birdseed, granola bars and cereal.

Crop Research

University of Illinois Professor, Donald Briskin specializes in herbal and medicinal plants. He has been actively involved, making several trips to Springfield as the Illinois State legislative bodies wrestle with the questions about whether or not to legalize the growing of industrial hemp. The first step, however, is to get permission to grow it on experimental plots at the University of Illinois.

Briskin explained that even in Canada, hemp seed is regulated, like a prescription drug. "You don't just walk into the FS Store and buy seed. It would be certified seed. Farmers must agree to a background check to ensure that they have had no felonies. They must also agree that government officials have the right to visit the field at any time during the growing season and take samples of the crop to verify that there is no drug production going on."

RESOURCES

North American Industrial Hemp Council

http://naihc.org/

Hemp Growers

http://www.hempgrowers.com/frames.html

Briskin is ready to proceed whenever he gets the green light. He plans to plant a 2-acre research plot. He will screen and evaluate new European varieties which have incredibly low levels of THC, analyze the plants for pathogens and look into how a certified seed industry would be developed.

The Pros and Cons of Industrial Hemp

Industrial hemp grows to about 13 feet in height. The stalks are cut off at the base, chopped into lengths about 2 feet long, rolled and bundled in bales. The next step in the process is to remove the fibers. This must take place within 40-50 miles of the growing field. The need for this part of the production to take place in such close proximity to the field, may mean that small farming communities could be revitalized with the addition of this processing.

Products made from hemp are biodegradable. It can be made into a non-woven composite which can be used by automobile manufacturers to press molds for dashboards and side panels, replacing fiberglass. European car companies have been using hemp in production for years because it is cheaper, lighter and stronger than fiberglass.

Rotating hemp as a third crop can greatly reduce the nematode population. And it's a smother crop; since hemp must be planted densely (200-300 plants/sq. yd.) and grows to be 9-13 feet tall in 90-110 days nothing can compete with it. It chokes out everything else. It requires about as much fertilizer as corn, but not as much herbicide for weed control.

So, what's the down side to industrial hemp? Behrensmeyer says that it may not do well in drought conditions and it can get weedy. One of the biggest obstacles may be acquiring the appropriate harvesting equipment, though. "The stems need to be cut when they are about half an inch thick and since hemp is a strong fiber, it's difficult to cut," Behrensmeyer continued. "Combines have been used to harvest seed and have caught on fire. The John Deere Kemper Harvester has been used, and in Europe they are working to develop new harvesting equipment."

Behrensmeyer concluded, "I'm a farmer with a two-crop rotation. If I could add hemp to that rotation, it would be better for the land and I'd have another crop to sell. And if seed research can be completed at the University of Illinois before other states, Illinois may be able to establish the first seed bank. We're all really missing out if this doesn't happen soon."

On January 9, 2001, a bill that would have allowed the University of Illinois to study hemp passed both in the Illinois House and Senate. On February 23, Governor George Ryan vetoed the bill citing concerns about funding and security. Proponents of the bill are hoping to find outside funding sources and develop security measures that will address the Governor's concerns.

Q & A on Aquaculture

Aquaculture Training

April 3, Ottawa
April 5, Effingham

As a result of receiving Sustainable Agriculture Research and Education (SARE) Professional Development grant funds Illinois USDA-Natural Resources Conservation Service (NRCS), Southern Illinois University Aquaculture Center, and the Illinois Fish Farmers Co-op are partnering to provide aquaculture awareness training to agency employees.

The training is being conducted in an effort to better prepare agency employees to assist producers exploring new aquaculture enterprises.

The Professional Development training, which is scheduled for April 2001, is open to all federal, state, and local employees who provide assistance to aquaculture producers.

For more information contact Roscoe Allen, State Outreach Coordinator, NRCS at (618) 244-0773 ext. 3 e-mail:roscoe.allen@il.usda.gov

Aquaculture is a form of agriculture that involves the propagation, cultivation, and marketing of aquatic animals and plants in a controlled environment. Although relatively new in Illinois, aquaculture is far from being a new industry. In fact, world fish farming was first practiced as long ago as 2000 B.C. in China. In the United States, aquaculture can be traced back to the mid to late 19th century when pioneers began to supply brood fish, fingerlings and lessons in fish husbandry.

Since the 1950s, the industry has grown, particularly in raising catfish, but today other aquaculture products such as salmon, striped bass, crawfish and tilapia have become popular. Interest in aquaculture is growing for hobbyists, entrepreneurs and farmers looking to expand their existing operation with a new "crop." But there are a lot of questions and the need for education in the how-tos of aquaculture.

John Glover, State Outreach Coordinator with the Natural Resources Conservation Service was awarded a grant to develop an aquaculture resource training manual which would be distributed to United States Department of Agriculture Service Centers. Glover believes that there is a much greater potential for the aquaculture industry in Illinois. He said, "There are currently 80 individuals in Illinois licensed to farm fish. Only nine of them derive 50% or more of their family income from fish farming. Most aquaculture permit holders raise fish as a hobby or as a small income supplement." Since Illinoisans consume more than 171 million pounds of seafood annually, this makes Illinois the largest inland seafood market in the United States. But less than one percent of fish/seafood is harvested from Illinois' waters.

In a huge show of support for aquaculture, the State of Illinois donated 12 million dollars to start the Illinois Fish Farmers Co-op. The city of Pinckneyville donated a building worth about 2.4 million dollars for the Co-op's use. Because of the growing interest in aquaculture and the new possibilities offered through the Co-op, we asked Steve Killian, executive director of the Illinois Fish Farmers Co-op to answer a few questions about the Co-op and aquaculture in general.

What are the biggest drawbacks to raising fish?

Killian: "The biggest drawback is availability of the capital needed to get started. The Co-op is working to educate bankers and other lenders that this is a viable venture. Bankers are unfamiliar with aquaculture and so they're hesitant to give loans."

What are the biggest fears?

Killian: "Aquaculture is a foreign concept to farmers. They're used to traditional row crops or livestock and it's really different to raise a product that's underwater and you can't see."

Should new farmers build indoor or outdoor ponds?

Killian: "In Southern United States and Illinois there are mainly outdoor ponds. The Co-op does not recommend indoor systems. The average farmer can't make that happen. It's just too expensive for the buildings, the pumps and the energy to fuel the operation. Some large companies like ADM in Decatur are doing it, but the Co-op is interested in helping the average farmer get started."

What kinds of fish are best to raise?

Killian: "The Co-op deals in channel catfish and hybrid striped bass and is looking into the possibilities of processing tilapia as well."

Why not trout?

Killian: "The Co-op doesn't deal in trout because they would only be available certain times of the year. Trout can't survive the winter so you have to restock ponds with fingerlings every year."

Are growth hormones used?

Killian: "No. Growth hormones are not approved and not used in aquaculture."

Do farm raised fish have fewer toxins?

Killian: "Farm raised fish are fed a controlled diet and so are not exposed to the natural waterway's environment so mercury in farm raised fish is unheard of. They are definitely a healthier option."

Will the stress on the fingerling population used for feed, eventually cause a problem in the ocean foodweb?

Killian: "Hybrid bass are fed a mixture of grains and some fish meal but not a substantial amount...like a drop in the ocean. Channel catfish and tilapia are not fed fish meal. They're fed a mixture of Illinois corn, soybeans, wheat and hog by-products."

Where does the feed come from?

Killian: "Right now feed mills in Arkansas and Mississippi come to Illinois to purchase corn, soybeans and wheat and take them back to their plants to make the feed, then bring it back for Illinois fish farmers. The Co-op hopes to eventually get a feed mill in Illinois."

What is the status of the fish processing facility in Pinckneyville?

Killian: "It's in the final design stages now. We hope to begin processing by next fall. We've already purchased a filet machine for $225,000 which can filet 40 fish per minute. And in order to begin building members, the Co-op

Aquaculture Publications Available from ATTRA

Evaluating an Aquaculture Enterprise

http://attra.ncat.org/attra-pub/aquaculture.html

Aquaponics – Integration of Hydroponics with Aquaculture

http://attra.ncat.org/attra-pub/aquaponic.html

ATTRA (Appropriate Technology Transfer for Rural Areas) is the national sustainable farming information center operated by the private nonprofit National Center for Appropriate Technology (NCAT). ATTRA provides technical assistance to farmers, Extension agents, market gardeners, agricultural researchers, and other ag professionals in all 50 states.

Note: You do not legally own and cannot legally sell the fish you raise in Illinois, until you have acquired an Illinois "Aquaculture Facility Permit." Without the permit, all fish in the State of Illinois belong to the State. Call the Illinois Department of Natural Resources—Aquaculture Coordinator, (309) 968-6837, for an application.

RESOURCES

Workbook & CD-ROM

A workbook and CD-ROM entitled "Getting Started in Freshwater Aquaculture" is available for purchase from Illinois-Indiana Sea Grant for $54 ($42 for Extension and Outreach Educators) plus tax and $6.50 shipping. This self-paced, interactive program covers such issues as biology, water quality of production systems, marketing and business planning.

To order a copy, call Cyndi Moore at 1-800-345-6087.

Prairie Lands Seafood

http://www.plseafood.com/links.htm\par

Catfish Institute

http://www.catfishinstitute.com/

currently buys fish from farmers and contracts with an outside company to haul them to a processing plant."

How do farmers get their fish to the processing center?

Killian: "Right now we contract hauling from the farms to the processing center. Eventually, the Co-op will have its own haulers and will pick up the fish and bring them live to the processing plant."

Is there a cost to farmers to join the Coop?

Killian: "Farmers pay $50 a year in dues and must obtain an aquaculture license from the Illinois Department of Natural Resources for about another $50. The Co-op buys the fish from the farmer and will process them. Whatever profit is made, is put back into the business. That way, more of profit stays on the farm. Members also have access to a diagnostics lab for water quality and fish health analysis."

What is the typical size of an aquaculture operation?

Killian: "Right now in Illinois, the largest operation is about 150 acres but they are adding on and hope to grow to about 300 acres. In other parts of the world there are fish farms as large as 6,000 acres."

What are the start-up costs for small operation?

Killian: "A small operation would be about 50 acres of surface water. If the land is already owned, a farmer would need about $250,000 in start-up costs to construct the ponds and buy equipment and the first year's operating expense—less if they already own a tractor and shop. In a larger operation, the cost per acre would be lower."

Species	Production Potential	Ease of Culture	Marketing Potential	Market Type
Channel Catfish	Excellent	Easy	Moderate	Foodfish Sportfish
Hybrid Striped Bass	Excellent	Moderate	Moderate	Foodfish Sportfish
Tilapia	Good	Easy	Moderate	Foodfish

This chart lists information about three recommended species. A listing of additional species can be found on pages 24 and 25 of a document found at the following Web address: http://ag.ansc.purdue.edu/aquanic/publicat/state/il-in/inplan.pdf

What is the average number of years before a farmer begins to realize a profit?

Killian: "Over the first 5 years the average is $700 profit per acre of surface water. That breaks down like this: the first year there is a deficit. The second year, they'll begin to see a profit. Years three through five, they'll see higher profits. And actually, we've seen the five to ten year average closer to $1,000 profit per acre of surface water."

For more information about the Illinois Fish Farmers Co-op contact Steve Killian, Executive Director at (618)357-3474 or e-mail: iffc@hotmail.com

On the Research Front

Alternative Crop Research: Updates on several research projects being conducted at the University of Illinois and Southern Illinois University.

Organic Farming Produces Less Nitrate in Drainage Water

Greg McIsaac has been gathering data comparing the nitrate concentrations in water draining from conventional and organically farmed fields and has found lower concentrations of nitrate in water draining from organic fields—most of the time. He believes that the lower nitrate concentrations is the result of several factors, including lower nitrogen fertilizer input in organic farming. Furthermore, the organic crop rotation involving corn, soybeans, wheat and clover, can reduce nitrogen loss by adding more carbon to the soil. This is good news for organic farmers who want to protect water quality. It could also be a motivator for consumers to buy organically grown products in order to help protect their own surface water.

In the next phase of the project, McIsaac will look at some of the economic implications of nitrate reduction effects of organic crop production practices. McIsaac says, "For instance, it costs a certain amount for water companies to remove the nitrate from drinking water. We'll look at whether it would be economically feasible for those companies to pay farmers an incentive to use organic production techniques."

Ornamental Grasses

It is becoming more and more common to see ornamental grasses used in managed landscapes throughout Illinois. The varieties most widely used are exotic, that is, not native to Illinois. Tom Voigt's group of researchers at the University of Illinois is looking for grasses that are new to Illinois. Voigt believes that there currently is a small number of grasses used over and over again. He says, "Plantings may become mundane and uninteresting. And, as in nature, we believe in bio-diversity; variety is a good thing. There are very few insect problems when many different plants are incorporated."

Voigt says that there is not a trick to growing these grasses; they are not difficult to propagate. Marketing them is the key factor. His research is also studying management strategies such as weed control, when to cut back and when and how to fertilize.

Test plots have already been planted at Cog Hill Golf Course in Lemont, Lewis and Clark College in Godfrey and at the Landscape Horticulture Research Center in Urbana.

The Benefits of Buckwheat

Researchers at Southern Illinois University (SIU) are examining the possibilities of developing and expanding buckwheat production in Illinois. Although a minor crop, buckwheat has been identified as a crop that; can do well on less productive soils, has an excellent "rotation effect", breaks disease cycles, has the ability to smother competitive weeds and increase the amount of plant available phosphorous in the soil in addition to having a relatively low cost of production.

For the most part, the interest in buckwheat production has come from organic producers. Organic cropping systems utilize extended rotations that include a variety of row crops and forages in addition to corn and soybeans. While some organic producers have developed excellent rotational systems in terms of agronomics, the lack of markets especially for crops other than organic corn and soybeans have limited the economic success of these agricultural systems.

The benefits of buckwheat make the crop an attractive crop for organic producers who do not rely on commercial fertilizers and pesticides. If markets for buckwheat are developed it would not just benefit the organic community. Other producers could benefit by having another cropping option in double crop or delayed planting situations.

continued

Currently, buckwheat is grown in Illinois by only a few producers, acreage is very limited and local markets are almost non-existent. SIU researcher, John Pike states, "We are not saying that buckwheat will ever be a major crop in Illinois but if markets can be identified and a system can be organized to pool the production from a number of farms, the crop could be a viable option for some producers. Thanks to a grant from USDA rural development we are in the process of assisting a group of organic producers in Illinois and surrounding states to organize a marketing cooperative to coordinate these activities."

If markets for buckwheat can be developed, it may stimulate producers to add more diversity into crop rotations. Diversity could help control pest problems that have developed in corn/bean rotations. Pike says, "While this system would not eliminate the problem, it could give producers a valuable cultural control option in their integrated pest management system. And buckwheat could possibly be a more dependable option than soybeans for a double crop in the northern two-thirds of the state."

The entire report can be found on the Web at:

http://www.siu.edu/%7Ereadi/grains/buckreport.htm

The Fruit of the Vine

One hundred years ago, the Midwest, including Illinois, was the third most important grape producing region in the United States. There were an estimated 5,471 acres of grapes in Illinois—950 acres of grapes in Hancock County alone. Prohibition in the 1920s reduced some of the grape industry and when 2, 4-D was introduced, primarily to combat broadleaf, it also inadvertently, decimated grape production in Illinois.

Today, grape growing in Illinois is experiencing a renewed interest. Robert M. Skirvin, professor of horticulture at the University of Illinois in the Department of Natural Resources and Environmental Sciences, is studying the commercial grape and wine industry in Illinois. He reports that there are currently about 21 wineries in state with about 300 grape acreage–a far cry from what it was a century ago, but still, encouraging.

Over a five year period, Skirvin is studying grape hardiness, adaptability, fruit production and wine quality in four regional sites around the state: St. Charles, Urbana, New Salem and Dixon Springs. Skirvin's research team includes Alan G. Otterbacher who handles the field plantings, Stephen Menke serves as enologist, and Margaret Norton works with the laboratory and greenhouse research.

For more information visit: http://w3.aces.uiuc.edu/NRES/faculty/Skirvin/cfar/index.htm This Web site includes a link to Virtual Winery software.

Research updates provided by Debra Levey Larson, Information Technology and Communication Services, College of Agricultural, Consumer and Environmental Sciences, University of Illinois at Urbana-Champaign.

Federal Programs Offer Assistance

Building Better Rural Places, a 2001 resource guide to federal programs offering assistance in agriculture, forestry, conservation, and rural community development, is now available in print and in electronic format.

Building Better Rural Places provides descriptions and contact information for 80 federal programs – primarily in the United States Department of Agriculture but also in the Environmental Protection Agency and Fish and Wildlife Service – that offer support to farmers and others seeking technical assistance, information, or financial resources on topics like:

- sustainable agriculture
- forestry
- entrepreneurship
- marketing
- adding value
- conservation
- community development
- sustainable land and resource management

The guide will be especially helpful to farmers, land managers, entrepreneurs, community developers, conservationists, organizations, and businesses. The guide also aims to help employees with USDA and other federal agencies become aware of and take better advantage of the enormous array of federal programs and resources available to support agricultural and forestry innovations.

The guide resulted from a collaboration of individuals from USDA agencies who are working together for sustainable rural development, and compiled in concert with the Michael Fields Agricultural Institute in Wisconsin.

To obtain a free, printed copy of *Building Better Rural Places* contact: Appropriate Technology Transfer for Rural Areas (ATTRA), P.O. Box 3657, Fayetteville, AR 72702
Phone: 800-346-9140
Fax: 501-442-9842

HTML and PDF web versions are available on the ATTRA Web page located at http://www.attra.org/guide/index.htm

ONE FARMER'S PERSPECTIVE

Just the Flax, Ma'am!

By Joel Rissman

One of the problems I foresee in organic agriculture is lack of diversity. We all hear and preach diversity, but many times that dirty word *economics* comes into play and the fun is removed and frustration sets in. It is hard putting small grains into your rotation when you know that the return barely pays the rent and expenses. As an Organic producer myself, economics drives more of my rotational decisions than I care to admit, or did I just admit it?

Back in the 40s and 50s, flax was part of the crop rotation in northern Illinois, as soybeans hadn't been introduced yet. My grandfather raised flax about 20 miles southeast of Waterman. I have heard that flax has been raised from Texas to Ontario and was one of the crops "lost" with the advent of monocropping and the soybean revolution.

Armed with this information, and a desire to take the economics out of my rotational decisions, I have been studying and running test trials on flax production for the last two years on my farm. Last year I received an SARE GRANT Titled: *Re-Introduction of Flax as a Viable Economic and Rotational Crop in an Organic System.*

Step by step, here is what I learned about flax production in northern Illinois.

Seed acquisition

I have only used two varieties: Rahab, a brown seeded type and Omega, a golden seeded type.

Alberta Lea in Minnesota and Gregs Seed in Wisconsin were able to get these for me. Any seed dealer can get seed given enough notice.

There are numerous varieties. I thought the Rahab yielded better than the Omega. This is strictly on observation and not by weight analysis. I saw a much greater stand of cover crop flax where the Omega had been seeded than where the Rahab had been seeded.

Rissman testing composted manure.

Back in the 40s and 50s, flax was part of the crop rotation in northern Illinois and was one of the crops "lost" with the advent of monocropping and the soybean revolution.

Although initially, I am looking for yield for feeding purposes, when the plan changes to expelling purposes, oil content and quality will have to be considered. Omega is reported to be higher in oil content, but the seed seemed to be lighter and more blew out the back end of the combine.

Time to sow

Any time you can sow spring seeded small grains, you can sow flax. The last two years I have seeded my flax after I was finished with my oats. If oats can survive, flax can survive. Flax is a cool weather crop. Frost and cold don't seem to bother it. This year the volunteer flax that came up after harvest is still nice and green after 4 or 5 frostings. It will kill after several Hard "20s" frosts. It makes a nice cover crop. Even though it is hard to kill, it seems to break down well in the soil, meaning I have not had problems with plugging the following spring tillage pass.

The seed bed should be worked the same as for oats. I have an old John Deere type B drill that I use, but no-till drilling should work also. I do recommend rolling or using a drill with press wheels for better seed to soil contact and faster germination. I have also broadcast , drug, then rolled after the initial soil finisher pass and had good luck.

We had rain afterwards which makes a big difference. Originally I was told to sow no deeper than 3", but this year my ground was so mellow, that it ended up 3"-4" deep. It came up just fine, and my recommendation is sow into moisture. It

continued

seems to me that at 3" the ground can dry up pretty fast.

One BIG thing to consider is where to plant flax. From experience, it is not very weed competitive. The past two years one could truthfully ask, "Hey Joel are you growing flax or lambsquarter?" Plant where you have low weed pressure such as after alfalfa. The good news is that heavy weed pressure doesn't seem to bother the yield because the crop is made before the weed pressure really turns ugly!

The sowing rate is still another big question. Last year I used 1 bushel (56#) per acre and got along fine. This year I used 75# and did just fine also. Now the unanswered question? If I increase seeding rates will the crop be more weed competitive? Will it lodge at too high a rate? Will it produce more yield at a higher rate? These are questions that were snubbed out this year due to an 8 acre crop failure. Let me explain. I generally work soybean stubble once with my soil finisher, then drill. This year I had a wild hair growing in the wrong place and decided to drill, then work the field. I thought this would mimic broadcasting possibly increasing yield and helping weed competitiveness. Unfortunately, this is where I had my seeding rate trials in half-bushel increments up to 3 bushel.

Apparently, God decided that this might be a good experiment for next year because we received no rain for one month. Upon inspection of the seed, it had sprouted 2" and then died from a lack of moisture. The other field that I worked, then drilled, came up just fine! Once again plant into moisture! I also had tried broadcasting 1 bushel of Don oats to see if this could help with weed control, and the two could be cleaned later. As a true Cubs and Bears fan, you just wait until next year!!

With the huge interest in human health and flax oils, I believe that in the future, expelling will have to be done on our farm to capture the true potential.

Time to harvest

Harvest was started both years the third or fourth week of July. I probably could have cut or swathed earlier, but waited until I had all my straw baled. Harvest can begin any time seedheads are brown and moisture levels are about the same as oats, 10-13% moisture. Flax stands well and takes lots of wind as this year proved. If you leave the flax stand too long after seedheads turn brown, it will send out auxillary shoots and bloom again.

There are two ways to harvest flax. The first way is to direct cut like harvesting oats or wheat. This is the way that I would *not* recommend.

The second method of harvesting is the way I *would* recommend. This way is swathing it first and letting it dry out, and then combine. Using a haybine would not work because the rollers knock off too many seedheads.

I swathed at a height that left about a 1 foot stubble. This allowed airflow underneath the windrows and aided in the drying process. After about a week's time I still used my conventional grain platform and just cut underneath the windrow. I probably cut 2"-3" off the top of the remaining stubble. The windrows fed into the platform just fine and I experienced no plugging. My platform has Gaterman guards every 30" and an enlarged reel kit. These were already on my combine and not added for the flax harvest.

Combine adjustments are as followed: I have a White 8900 conventional type combine. The cylinder speed is set above 1000 rpm, concave to cylinder setting at 3". I set the fan speed at 350-400, very low and direct the windboards toward the back of the cleaning shoe. This way the light seed has a chance to fall into the cleaning shoe rather than blowing out the back. Chaffer and sieve are set at about an 1/8-1/4", enough so the seed pods can fall back in. There is also a concave blank that can be put on the front of the concave to aid in threshing of small seeded grains such as alfalfa, clover, flax etc. What this does is plug up the front holes of the concave and allow greater threshing action.

While combining, I allow the straw to fall on a windrow and then bale it for bedding for cattle. I was careful the first year not allowing the cattle to have too much at one time for bedding. I wasn't sure if it would make them sick because the growing plant has prussic acid in it. My

fears were unfounded and the dried straw had no effect on the beef cattle that ate it. Apparently the acid levels are only present in the green materials, not the dried straw. I also noticed no difference in the breakdown of the straw in the compost.

My final observation on flax harvesting is the flax is cut or swathed before the weed has a chance to make a seed head or produce a viable seed. Thus you are not contributing to the weed problem because you're germinating weeds without replacing their seeds!

Yield and economic potential

When researching flax I was told that yields could range from a low of 10 bu/ac to a high of 50 bu/ac. Last year I accidently produced 30 bu/ac over the scales. This was direct cut harvest, 56#'s/ac seeded. This year was a different story. I made the mistake of passing up all the nice dry weather and listening for the weatherman to say that the 5-day forecast called for no rain. I swathed my flax. The third day (of the five) we had a pounding two inch 2 hour rain that drove my flax right to the bottom of the stubble. I was forced to rake it (NH 256 ground-driven) so it could dry out properly. Even though I raked slowly and in the morning when the stems were rubbery, I still lost many seed pods. All in all I weighed 15bu/ac flax. This was seeded at 75#'s /ac. Yield loss was substantial considering how thick the flax cover crop is! Maybe 5-15 bu/ac loss. What do weathermen know anyway?

Last year I had a price quote from Richard Peterson from S&K INT. for $11/bu on the farm in semi-load quantities. I sent a sample to see if it was acceptable and they confirmed it was. Flax also qualifies in the oilseed program and I received a little over $50/ac for the LDP and Farmer Welfare Program put out by the USDA. With the huge interest in human health and flax oils, I believe that in the future, expelling will have to be done on our farm to capture the true potential.

One parting remark, is that flax is very fluid and combines, wagons and bins will have to be pretty tight. This means *break out the duct tape!*

Internships and Apprenticeships Available

The Year 2001 edition of *Sustainable Farming Internships and Apprenticeships* list from Appropriate Technology Transfer for Rural Areas (ATTRA) is completed and available in both print and electronic formats.

Farmers have reported from Alaska to Virginia that, year-after-year, the interns that come to work and live with them learn about these on-the-job training and work opportunities through the ATTRA Internships List.

The 2001 update is 90 pages long, with over 250 entries describing farms and educational training centers and organizations offering internships and apprenticeships in organic farming and sustainable agriculture.

Sustainable Farming Internships and Apprenticeships is compiled by Katherine Adam, ATTRA Program Specialist. Please direct any questions to: kadam@attra.org

Print copies may be requested through:

Appropriate Technology Transfer for Rural Areas
P.O. Box 3657
Fayetteville, AR 72702
1-800-346-9140
8:30am-4:30pm CST
http://www.attra.org

For an electronic version visit:

http://www.attra.org/attra-rl/intern.html [HTML]

http://www.attra.org/attra-rl/internlist.PDF [PDF]

Workshops Offered on Land Use Issues

Local officials, developers, citizens and others interested in land use issues will have the opportunity to hear the latest information and ideas on land use issues from experts during a series of workshops to be offered this spring and summer by University of Illinois Extension. "These meetings are a response to a growing interest in land use issues throughout the state," said Jeri Marxman, Extension public policy education specialist.

The Land Use workshops will include both morning and afternoon sessions. Faculty from the U of I Department of Urban and Regional Planning will lead off the morning sessions. Other participants in the morning will include representatives of the Illinois Growth Commission, as well as state, county, and municipal officials who will discuss local government's role in determining land use policy.

Afternoon presentations will center around the theme, "Building a Land Use Tool Box for Decision Makers." This part of the program will provide participants with ideas applicable to managing land use at the local level as well as practical experiences shared by those who have already faced some of these issues. Some of the topics that may be addressed are: septic systems, private property rights and limits, annexation issues, open space ordinances, land preservation, farmland and groundwater protection and housing density.

Currently, workshops are being planned for several locations around the state, including: Mount Vernon, Springfield, Galesburg, Pontiac, Collinsville and Sycamore.

Those wishing to attend a workshop or would like further information should contact Jeri Marxman, (217) 244-2850, e-mail: marxmanj@mail.aces.uiuc.edu.

AGRO-ECOLOGY
News and Perspectives

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News and Perspectives

AGRO-ECOLOGY

Science and Education for a Sustainable Agriculture

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SUMMER 2001

Improving the Soil and Beating the Weeds on the Road from Conventional to Organic Farming

by John Masiunas

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Organic farming systems are a small but growing sector of Illinois agriculture. Organic farmers have identified a number of areas where research is needed. Weed management and the transition from conventional to organic systems are especially problematic. And, the ecological principles learned from organic research are critical to address the adverse environmental effects of conventional agriculture and develop more sustainable cropping systems.

Using Cover Crops to Suppress Weeds

Several of my projects have concentrated on using cover crops to suppress weeds in organic vegetable systems. Cover crops are planted in the fall, allowed to overwinter, and killed in the spring by either mowing or rolling. The crop is then planted no-till into the cover crop residues. Our research found that cereal rye was one of the best cover crops for use in central and northern Illinois. Cereal rye does well in clayey loam soils common to Illinois. It can be successfully planted in late September to October, overwinter, and grow rapidly in the following spring. Rye during its decomposition releases chemicals which suppress weeds.

However, the growth and yield of some vegetables, such as snap beans and pumpkins, have been reduced in rye cover crop systems. The reduced vegetable growth is most likely due to the rye suppressing crop growth and to soil compaction. Strip-tillage can reduce early season soil compaction but by the end of the season soil compaction levels were similar to those in the solid rye. This was likely due to wetter soils under rye residues and the increased equipment traffic through the field necessary to manage the rye.

continued on next page

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Agro-Ecology News and Perspectives Editorial Committee: Shannon Allen (Macon County Soil and Water Conservation District), Juli Brussell (Illinois Stewardship Alliance), Rick Farnsworth (UIUC, Agricultural and Consumer Economics), Dan Faulkner (UIUC, Animal Sciences), Mike Gray (UIUC, Crop Sciences), Ted Funk (UIUC, Agricultural Engineering), David Onstad (UIUC, Natural Resources and Environmental Sciences), Bob Reber (UIUC, Food Science and Human Nutrition), Gerry Walter (UIUC, Human and Community Development) and Sherry Weaver.

Please address all correspondence to: *Agro-Ecology* Editors, 211 Mumford Hall, 1301 West Gregory Drive, Urbana, Illinois 61801.

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If you would like to receive future issues of Agro-Ecology News and Perspectives, contact Deborah Cavanaugh-Grant, (217) 968-5512, e-mail: cavanaughd@mail.aces.uiuc.edu.

Cereal rye (left) serves as a wind break and habitat for beneficial insects. Floating row cover (white strip, right) over rows of young pumpkins to exclude cucumber beetles. *Photo by Jeromy Biazzo*

Soil, continued

Our future research on cover crops will concentrate on using combinations of cereal rye and hairy vetch to reduce problems from using cereal rye alone. Hairy vetch is commonly used by sustainable farmers in southern Illinois, but has problems consistently overwintering north of Champaign. Hairy vetch fixes nitrogen, produces a large amount of biomass, but decomposes too rapidly to provide good weed suppression. A cereal rye/hairy vetch mixture may overcome the overwintering and rapid decomposition problems of hairy vetch. Rye improves the survivability of vetch by holding snow and covering the vetch. In the spring, vetch climbs on the rye stems, resulting in less matting on the ground, allowing us to control the cover crop with rolling. The rye residues within the mixture will provide weed control for a longer period than vetch alone.

Living Mulches Suppress More than Expected

Besides our cover crop research, my students and I have also evaluated living mulches for their ability to provide weed control in organic systems. Living mulches are grasses or legumes which are still alive when a vegetable or grain crop is planted. Living mulches offer many of the advantages of intercrops or permaculture, such as improving the soil, reducing erosion, and providing a more diverse habitat. We evaluated white clover, red clover, perennial ryegrass, and canola. Perennial ryegrass and white clover provided the best weed suppression. Interestingly, although the living mulches were only planted between the crop rows, the living mulches also suppressed weeds within the crop row. The living mulches did reduce okra and pepper yields. Mowing of the red clover improved pepper yields but not okra yields. We also found that as the systems stabilized and the living mulches became established the vegetable yields improved.

We recently conducted a study on four organic vegetable farms in central Illinois. The study determined how management practices and soil characteristics affected weed populations. The seedbanks on these farms were dominated by late summer annual weeds such as redroot pigweed, ivyleaf morningglory,

Mixed crops planted in a small area. Composted mulch between rows to reduce weed growth.
Photo by Jeromy Biazzo

and common purslane. Soil characteristics such as organic matter content, pH, the ability to hold nutrients, and concentration of a few nutrients were more correlated with weed populations and soil seedbanks than were the management practices that the farmer used. This suggests that the emphasis on improving the soil which occurs in organic agriculture has a major effect on weed populations. Fields as they are transitioned to organic systems often have severe weed problems that become less when in organic production for longer periods of time.

Certified Organic Fields Needed

One big limitation of our previous research is that although we used materials approved for organic farms, we did not conduct the research in certified organic fields. We have started to rectify the problem by transitioning land on the University South Farms. We have been transitioning 3 acres per year and will have land ready for certification starting in 2002. The long range plans are to have sufficient land to allow for research on integrated organic farming systems which include organic livestock. Plans are also to develop a farmer advisory board to provide input and direction on operations and research at this facility.

John Masiunas is a professor and researcher in the Department of Natural Resources and Environmental Sciences at the University of Illinois at Urbana-Champaign.

A field of mixed organic greens in West-Central Illinois. *Photo by Jeromy Biazzo*

Exterior sideview of a Hi-Tunnel system.

The Hi-Tunnel: A Tool for Extending the Growing Season

by William H. Shoemaker

One of the problems faced by commercial vegetable growers in the northern states is the relatively short season of production for their perishable crops. While consumers demand fresh vegetables year-round, northern growers can only supply fresh crops for about a three month period, from July through September.

The shortness of the northern growing season has led to a decided disadvantage for the industry in the Midwest. The competitive advantage of year-round production, the relative inexpense of shipping commodities, advances in post-harvest handling and government policies which promote free trade have strengthened southern vegetable growing areas, including Florida, California-Arizona, the Texas Rio Grande region and Mexico. Produce from these areas can be purchased by commercial buyers year-round. And as the produce/grocery industry experiences consolidation, buyers limit the number of sources they buy from, favoring those which can consistently and continuously supply acceptable product.

Tomato transplant study in Hi-Tunnel–just planted.

This paradigm shift in the northern commercial vegetable industry has called for new tools and technologies to help vegetable growers achieve their marketing goals. The Hi-Tunnel system is an emerging technology which potentially allows vegetable growers to plant and harvest high-value vegetables, such as tomatoes, as much as 5-weeks earlier than previously possible and extend the end of the production season 6-8 weeks later into the year. This means the grower can double the season, making the enterprise more reliable as a source for consumers.

The Design and Development of the Tunnel

The Hi-Tunnel design was developed in the late 80s by Dr. Otho Wells of the University of New Hampshire, who did pioneering work with plastic films during the early years of the development of plasticulture. The Hi-Tunnel system uses a unique design applied to a standard cold-frame hoophouse. A hoophouse uses heavy-duty galvanized steel pipe bent into semicircles and set upright in 4' to 6' increments to create a tunnel structure. The structure is then covered with a greenhouse grade plastic film and the ends are closed to finish the tunnel system.

Ventilation and Irrigation in the System

The key feature of the Hi-Tunnel is a ventilation system. The sides of the Hi-Tunnel have a hipboard attached to the pipe frame at about 30" above the ground. The plastic covering is attached tightly to the hipboard on both sides of the tunnel and allowed to drape to the ground below the hipboard. A 1.5" pvc pipe is prepared to run the length of the tunnel on each side and, using duct tape, is attached to the low end of the plastic cover. With a t-fitting at one end of each pipe and a couple of stub pieces glued to the alternate holes of the t-fitting, a t-handle is created, allowing the operator to roll up the plastic to the hipboard. This creates an opening the length of the tunnel and 30" high on both sides. Air movement through the tunnel then stabilizes the build-up of heat within the tunnel and allows the operator to regulate to development of

heat. This become the most critical element of tunnel management during the growing season.

Other important elements to the design include the installation of a drip irrigation system to provide water to the crops. No rainfall will occur in the tunnel so water needs must be met with irrigation. Also, a plastic film covering the floor of the tunnel eliminates weed problems and helps hold moisture and heat in the soil. A greenhouse plastic is unnecessary for this purpose. Four mil construction grade black plastic film is inexpensive and ideal. The film should completely cover the floor and the edges should be fastened to the baseboard sides of the tunnel. Plants can then be set in the ground underneath the plastic by carefully cutting slits in the plastic and transplanting the root system into the prepared soil beneath.

Extending the Seasons Inside the Tunnel

The purpose of the Hi-Tunnel system is to capture solar energy passively, warming up the air and the soil within the Hi-Tunnel and creating conditions appropriate for crop production. It also provides a significant increment of protection against damaging frosts and freezes, which provide the limiting factor for planting date in the north, both in Spring and Fall. Work at the St Charles Horticulture Research Center, St Charles, IL, has demonstrated that tomatoes can be planted in Hi-Tunnels in northern Illinois as early as April 10, without supplemental heat. Field grown tomatoes are generally planted no earlier than May 15 in the same area. Frost protection has been adequate and the heat generated by the tunnel ensures active growth and development of the tomato crop. With proper management, the Spring tomato crop is ready for the first picking by June 20. This is several weeks earlier than the field-grown crop. Quality and productivity have been very good, with no compromise associated with the Hi-Tunnel environment.

Organic Pros and Cons

An unexpected benefit to the Hi-Tunnel growing system that has particular benefit to organic growers has been the lack of disease development in the tomato crops. This is probably due to the lack of leaf wetness, which is a critical element of foliar blight development. Crops in the tunnel receive no rain and are irrigated at the base of the plants with a drip irrigation system, ensuring that the foliage of the plant remains dry. This eliminates the need for fungicides, which are commonly used to protect field-grown tomatoes in the Midwest.

On the other hand, insects can become a serious problem in Hi-Tunnels as they can become trapped within the system. An example occurred in the Spring, 1999 tomato crop at the St Charles Horticulture Research Center, when a Tomato Hornworm moth was trapped inside the tunnel. It was a fertile female that laid multiple eggs on most of the plants. Within days an army of tomato hornworm larvae began feeding on the plants. Early detection and Bt insecticide, an organic remedy, eliminated a disaster, however the incident demonstrated that an attentive program of scouting must be in place within the Hi-Tunnel.

Northern Illinois Weather Pushes the Limits of the Hi-Tunnel

Though Fall crops may be planted in Hi-Tunnel systems, research at the St. Charles Horticulture Research Center has shown the Fall season to be more problematic. Abrupt shifts in weather patterns have led to outbreaks of cold weather in October that were too extreme for the Hi-Tunnel environment. Temperatures reaching 24oF have been sufficient to cause freeze damage to crops within the tunnel. Yet, average temperatures in the Fall remain warm enough to allow the tunnel system to remain productive through October and perhaps well into November in some years. Research designed to address that problem as well as answer several other questions has been proposed and, if funded, will advance understanding and utility of Hi-Tunnel systems for northern Illinois commercial vegetable growers.

William H. Shoemaker is a Senior Research Specialist at the University of Illinois at Urbana-Champaign in the Department of Natural Resources and Environmental Sciences located at the St. Charles Horticulture Research Center.

Young tomatoes staked inside the Hi-Tunnel.

News Briefs

Organic Research in Transition at Some Land Grant Institutions

Organic Farming Research Foundation (OFRF) recently published its State of the States report on organic farming systems at land grant institutions. The report states that of the country's 885,863 available research acres in the land grant system, only 151 acres (0.02%) is being used for certified organic research.

The report applauds the land grant institutions in Colorado, Iowa, Minnesota, New Jersey and Washington for certifying their research land and lists Illinois as one of the states who are "transitioning research acreage to organic certification." The full report is available on the Web at: http://www.ofrf.org/publications/SoS/SoS.light.pdf

John Masiunas, Associate Professor in Natural Resources and Environmental Sciences at the University of Illinois said, "There are a number of faculty in the College of Agricultural, Consumer and Environmental Sciences who are interested in conducting research and developing courses on organic farming but one big limitation has been the lack of certified organic land on any University research farms. Two years ago we started the process of developing a site for organic research by transitioning a 3 acre plot on the Cruse Tract, part of the South Farms. Last year we started the transition process on another 3 acres and our plans are to transition 3 acres each year."

Masiunas continued to say that the University will be identifying a person who will be responsible for record keeping and ensuring that the facility meets requirements for certification, and is certified. Interested farmers and the public are invited to participate in the process. Contact John Masiunas at (217) 244-4469 or E-mail: masiunas@uiuc.edu

Recent Count Shows 7,800 Certified Organic Farmers in U.S.

The Organic Farming Research Foundation (OFRF) announced the results of its annual count of the nation's certified organic farmers. As of January 1, 2001 there were 7,800 certified organic farmers in the U.S. This figure represents an 18% increase in the number of certified organic growers over the 1999 total of 6,600.

OFRF maintains the National Organic Certifiers Directory as part of its efforts to maintain direct contact with organic farmers for the purposes of research and education. Certifying agencies provide verification that growers, processors and handlers are complying with organic standards.

OFRF is a non-profit, tax-exempt foundation directed by certified organic farmers. The Foundation sponsors research related to organic farming; disseminates research result to organic farmers and to growers interested in adopting organic production systems; and educates the public and decision-makers about organic farming issues.

Number of Organic Growers Per State

(Note: Because the number of certified growers changes frequently and many organic farmers are not certified, what follows is an approximate listing of certified organic growers by state.)

Alabama/Georgia	28	Illinois	129	Michigan	260	New Mexico	100	South Dakota	76
Alaska	5	Indiana	76	Minnesota	138	New York	279	Tennessee	180
Arkansas	26	Iowa	282	Mississippi	0	North/South Carolina	96	Texas	147
California	809	Kansas	173	Missouri	95	North Dakota	88	Utah	49
Colorado	210	Kentucky	93	Montana	155	Ohio	348	Vermont	350
Connecticut	52	Louisiana	21	Nebraska	118	Oklahoma	16	Virginia	98
Florida	100	Maine	250	Nevada	19	Oregon	400	Washington	518
Hawaii	90	Maryland	250	New Hampshire	56	Pennsylvania	277	West Virginia	17
Idaho	177	Massachusetts	80	New Jersey	61	Rhode Island	34	Wisconsin	203

The National Organic Certifiers Directory is available on the OFRF Web site at: http://www.ofrf.org/publications/certifier.html.

To receive a copy of the directory by mail, please contact OFRF at P.O. Box 440, Santa Cruz, CA, 95061 (831) 426-6606; research@ofrf.org.

For information about the Organic Crop Improvement Association (OCIA) in Illinois, contact:
Joel & Adela Rissman
P.O. Box 456
Waterman, IL 60556
(800) 701-6242
E-mail: ociail@thestix.net

Joel Rissman reports that Illinois members of OCIA grow corn, soybeans, oats, wheat, barley, flax, hay, vegetables, herbs, rye, buckwheat, zucchini, squash, pumpkins, spelt, asparagus and mushrooms—also, beef, chicken, turkey and pork.

Organic Orchards Get Top Marks

A recent study of apple farming found that organic orchards can be more profitable, produce tastier fruit at similar yields compared to conventional farming, and be better for the environment. The study was conducted by researchers at Washington State University in which three experimental plots of golden delicious apples were farmed using organic, conventional, and integrated growing methods over a six year period.

Researcher, John P. Reganold concluded that the results of the study, "show that organic and integrated apple production systems in Washington State are not only better for soil and the environment than their conventional counterpart but have comparable yields and, for the organic system, higher profits and greater energy efficiency."

For more on the study see: *Nature*, Vol. 410 April 19, 2001 or www.nature.com.

Awareness of Sustainable Ag is High Among Conventional Farmers

According to the Trends in Agriculture 2000 Study conducted by The Gallup Organization, of the 1,218 large farmers and ranchers polled, 60% are aware of sustainable agriculture practices but only 23% say they use these practices.

In this study, sustainable agriculture was defined as "having the goal of eliminating or substantially reducing dependence on energy, synthetic fertilizers and pesticides, and incorporating more ecologically sound practices that preserve the nation's soil, water, plant and animal resources."

The top obstacle to sustainable agriculture from 89% of the conventional farmers who were polled was the perception of lower productivity. Economic reasons was sited in 61% of the responses, 36% said they don't know how to do sustainable agriculture, 17% said their landlord won't allow it and 15% were concerned about what the neighbors would think.

Survey results can be seen at: http://www.agmedia.org

Nationwide, Scientists and Organic Farmers Dialogue about Cutting-edge Research

Recognizing that there is still a long way to go in building effective research on organic agricultural systems, the California-based Organic Farming Research Foundation (OFRF), with grant support from the Charles Stewart Mott and the Jessie Smith Noyes Foundations, leads a project that brings together both producers and scientists. The *Scientific Congress on Organic Agricultural Research* (SCOAR) creates opportunities for a scientific dialogue about organic agriculture as a peer relationship between farmers and scientists, rather than using a "customer-provider" model. The project mission statement says, "There are certainly language and protocol barriers to overcome, but our premise is that there are equal opportunities for learning and information exchange."

SCOAR is conducting a series of regional meetings with farmers and scientists to discuss and design plans for basic, applied and developmental organic research. Juli Brussell, an ideal member on the SCOAR steering committee, fits both categories. She and her husband, Kevin, organically farm more than half of their 500+ acre farm in Casey, Illinois. Juli has also served on the advisory committee for an Illinois Council on Food and Agricultural Research (C-FAR) project on Improving Farm Incomes and Rural Community through the University of Illinois and worked with that project as a research specialist. She is newly elected to the OFRF Board, as well as serving on the SCOAR steering committee with Kevin.

About the SCOAR project, she said, "This dialogue between organic farmers and the scientists who develop research agendas and programs at land grant colleges and other academic institutions is invaluable. The scientists provide methodology and a theoretical framework; the farmers provide field-based reality and *a priori* knowledge about organic systems. The marriage of these parameters determines a truly useful and unique approach to agricultural research. We hope that these efforts will serve as a blueprint for new state and federal organic research programs."

More information is available on the Web at: http://www.ofrf.org/scoar/

If you are interested in becoming involved and/or receiving updates on the SCOAR project, please contact:

Mark Lipson,
Policy Program Director
Organic Farming
Research Foundation
P. O. Box 440
Santa Cruz, CA 95061

Phone: (831) 426-4006, ext.6606
Fax: (831) 426-6670
E-mail: mark@ofrf.org

Organic Web Sites

Appropriate Technology Transfer for Rural Areas (ATTRA)
http://www.attra.org

An Overview of Organic Crop Production **http://www.attra.org/attra-pub/organiccrop.html**

Organic Certification Organizations and Programs **http://www.attra.org/attra-pub/orgcert.html**

National Organic Program (NOP) Final Rule **http://www.attra.org/attra-pub/nop.html**

ATTRA. Organic Marketing Resources **http://www.attra.org/attra-pub/markres.html**

Biological Control Home Page / Cornell University
http://www.nysaes.cornell.edu/ent/biocontrol
Bio-control agents guide, parasitoids, predators, pathogens, weed feeders, related biological control links.

International Federation of Organic Agriculture Movements (IFOAM)
http://www.ifoam.org
Conferences, standards, accreditation program, publications.

Missouri Alternatives Center "Extension Information on Alternatives"
http://agebb.missouri.edu/mac/links/index.htm for this database.

A collection of online Extension publications arranged by topic, including organic certification and organic farming.

National Commission on Small Farms
http://www.reeusda.gov/agsys/smallfarm
National recommendations for policy change directed at the support and preservation of small farms. "A Time to Act" document available on-line.

Organic Alliance
http://www.organic.org
The Alliance promotes the environmental and economic benefits of certified organic food production to farmers, processors, distributors, retailers, and consumers.

Organic Crop Improvement Association (OCIA) **www.ocia.org**

Organic Farmers Market Association (OFMA) **http://www.iquest.net/ofma**
Organic standards, Organic Foods Production Act, legislation, market reports, resources.

Organic Farming Research Foundation
http://www.ofrf.org
National organic farm survey and organic research reports.

Organic Growers and Buyers Association (OGBA) **http://www.ogba.org**

Organic Trade Association
http://www.ota.com
Publications, news, events, directory of organic producers, certifies, brokers, packers, etc.

Sustainable Agriculture Network (SAN)
http://www.ces.ncsu.edu/san/
USDA's SAREP: sustainable agriculture directory of expertise, reports, publications, and discussion groups.

Sustainable Agriculture Research and Education (SARE)
http://www.sare.org Click on the National Projects Database.

United States Department of Agriculture (USDA) Economic Research Service **http://www.ers.usda.gov/whatsnew/issues/organic/**
An Issues Center devoted to organic farming. It contains analyses of data about organic farming, crops, and livestock, throughout the United States. Data tables detail individual crops and livestock by State.
http://usda.mannlib.cornell.edu/reports/erssor/specialty/vgs-bb/1977
1994 organic food & fiber analysis of certified producers, organic foods marketing reports

United States Department of Agriculture (USDA) National Organic Program (NOP)
http://www.ams.usda.gov/nop/index.htm

Wallace Center for Agricultural and Environmental Policy
http://www.winrock.org/what/wallace_center.asp
Winrock's Wallace Center uses sound policy analysis, research, and evaluation to further sustainable and equitable agriculture and food systems, promote natural resources management, strengthen rural communities, and shape U.S. agricultural and food policy agendas. Educational programs and policy reports foster debate and understanding.

RESOURCES

Organic Grain-Growing Videos

www.sare.org/projects/
search for ENE98-038

Chicago's Organic Food Network

(630) 752-8006

Production-Oriented Videos Teach Organic Grain-Growing Tips

When a national organic dairy opened on Maryland's Eastern Shore in 1996, mid-Atlantic grain producers realized they had an opportunity to add value to their product. They knew how to grow corn and beans, but now they wanted to do so organically — and needed help.

Recognizing that new niche, University of Maryland extension educator John Hall applied for a Sustainable Agriculture and Education grant (SARE) grant to create tools that agricultural professionals could use to teach farmers the basics of organic grain production.

The final product — a three-part video series produced at Cornell University in conjunction with USDA's Agricultural Research Service-Beltsville, Penn State University and the University of Maryland — provides essential production information and a colorful mix of examples from successful organic grain farmers. University researchers explain how to create diverse agricultural systems with innate abilities to combat pests, use minimum tillage to minimize compaction and preserve insect habitats, and plant cover crops to build the soil.

The videos chronicle a fictional farm family's transition from conventional grain production to holistic planning and also feature farmers from Maryland to New York attesting to their reasons for choosing organic production. Reviews from grain farmers have been positive. "The video makes a lot of organic production practices more legitimate and makes it easier for farmers to participate and change over," said Richard Winters, a Kennedyville, Md., grain grower.

The video series debuted at professional development training event in Pennsylvania in April 2001. The project has spawned a nonprofit institute in eastern Maryland that is exploring other marketing outlets for organically produced grain to expand beyond animal feed.

For more information, go to www.sare.org/projects/ and search for ENE98-038

Chicago's Organic Food Network

To join Chicago's Organic Food Network and receive *The Organic Food Basket* semi-monthly online newsletter, activism alerts between newsletters, discounts on events and classes and membership in the Living Foods & Friends Dinner Club, send your one-time membership fee of $25 to: Nutrition Show & Tell, P.O. Box 4086, Wheaton, IL 60189. Include your name, address, phone number and E-mail address. *The Alternative Guide to Buying Natural and Organic Food,* is a free gift to new members. For more information call: (630) 752-8006.

Summer 2001 Field Day and Workshop Schedule for Illinois Family Farmers

For more information and an updated schedule with times, dates and locations, call Juli Brussell at (217) 923-5190; E-mail: rainycrkjb@rr1.net or call the ISA office at (217) 498-9707. Information is also available on the University of Illinois Agroecology and Sustainable Agriculture Program Web site at http://www.aces.uiuc.edu/~asap/calendar/wtsnew.html

July 13-Friday
Small Farm Enterprise Workshop

Location:
Rock Island Extension Building (Quad Cities/Rock Island area)
Topics will include producing and marketing organic produce and herbs, free-range poultry production, and viticulture. Listen to farmers and resource experts talk about developing a small farm focus with these alternative enterprises.
Time:
Registration—9:00 a.m.; sessions run from 9:30 a.m. to 4:00 p.m. with a one-hour break for lunch.
Cost: $10 (includes lunch)
To register contact:
Dan Beccue (309) 792-2500, ext. 210 beccued@mail.aces.uiuc.edu

July 14-Saturday
Illinois Stewardship Farm Day

Location:
Richland Community College, Decatur and the Allen Williams farm, Cerro Gordo
Includes Herm Beck-Chenoweth on free-range poultry production and sessions on organic production and marketing, grass-fed beef production, and much more.
To register contact:
Jan Thomas (217) 498-9707 ilstew@fgi.net

July 16-Monday
Profits with Pizzaz!

Location:
Illinois Valley Community College, Oglesby, IL (LaSalle-Peru area)
All-day marketing seminar for Illinois Stewardship Alliance and Illinois Sustainable Agriculture Society members only (membership in either ISA or ISAS is included in the registration cost). Advance registration requested to ensure a reservation for lunch.
Presenter:
Herman Beck-Chenoweth—farmer, marketing wizard, and author from Creola, Ohio. Founder of Resilience Institute and recipient of a North Central Sustainable Agriculture Research and Education (SARE) grant to develop and teach free-range poultry production and marketing in the 12-state north central region.
Time:
Registration—9:00 a.m.; sessions run from 9:30 a.m. to 4:00 p.m. with a one-hour lunch break. Bring your marketing questions and appetite for information.
Cost: $15
(includes lunch and a one-year membership to either ISA or ISAS)
To register contact:
Jan Thomas (217) 498-9707 ilstew@fgi.net

July 17-Tuesday
Enterprise Workshop and Sustainable Agriculture Field Day

Location:
Lake Land College, in Mattoon, IL
Take the field tour of Lake Land College's alternative crops in the morning; attend the alternative enterprise session in the afternoon. Topics for the afternoon workshop include grass-based meat and dairy, free-range poultry production, and developing an organic herb and produce operation on your farm.
Time:
Field tour starts at 9:00 a.m.; peruse the Back Forty Bookstore after the tour. Lunch is served at 11:45 a.m.; afternoon workshop runs from 1:00 p.m. to 5:30 p.m.
Cost:
The morning tour is free. The workshop costs $10 (includes lunch)
To register contact:
Juli Brussell at (217) 923-5190 rainycrkjb@rr1.net

July 27-Friday
Healthy Soils and Healthy Profits—
Southeastern Illinois Sustainable Agriculture Association (SISAA) Farm Field Day

Location:
Rainy Creek Farm and Richard's Farm Restaurant, Casey, IL
Keynote speaker will be Gary Zimmer, president of Wisconsin's Midwest Bio Ag and author of The Biological Farmer. On-arm research plots for organic transition will also be featured and Kevin Brussell, marketing director for the Midwest Organic Farmers Cooperative, will discuss market trends in organic grains and beans, as well as OFARM, a national marketing agency-in-common for organic farmers.
Time:
Registration—9:00 a.m.; field tours start at 9:30 a.m.; lunch and afternoon session from 11:45 a.m. to 4:30 p.m.
Cost: $10 (includes lunch at Richard's Farm Restaurant in Casey).
To register call:
Walt Townsend (618) 897-2560

August 4-Friday
Alternative Enterprise Workshop

Location:
Dunn-Richmond Economic Development Center, Carbondale, IL
Topics will include agroforestry options for your farm, grass-based meat and dairy production, and developing an organic produce and herb business.
Time:
Registration—9:00 a.m.; the session runs from 9:30 a.m. to 4:00 p.m. with a one-hour break for lunch.
Cost: $10 (includes lunch)
To register contact:
Mike Plumer (618) 453-5563 plumerm@mail.aces.uiuc.edu

August 17-Friday
Illinois Alternative Enterprise Workshop

Location:
University of Illinois at Springfield campus, Springfield, IL
Topics will include farm-scale aquaculture, agritourism opportunities, and viticulture.
Time:
Registration—9:00 a.m.; session runs 9:30 a.m. to 4:00 p.m. with a one-hour break for lunch.
Cost: $10 (includes lunch)
To register contact:
Deborah Cavanaugh-Grant (217) 968-5572
cavanaughd@mail.aces.uiuc.edu
Note: Please pre-register by August 10th.

On-Farm Composting Workshops

July 12—Illinois State University Research Farm
September 6—Alan Dale Farm near Princeton

Each Workshop will consist of a morning discussion session and an afternoon tour of a farm composting operation. Topics will include benefits of compost as a soil amendment, how composting fits into a nutrient management plan, regulations, marketing issues, compost quality and testing, and composting for large and small operations.

The workshops are being sponsored by University of Illinois Extension, Illinois State University, and the Illinois Department of Agriculture, Sustainable Ag Grant program. Certified Crop Advisor credits in Soil and Water Management will be available.

For registration materials, contact your local Extension office, or call: Duane Friend, Springfield Extension Center (217) 782-6515

Mid-West Pastured Poultry Field Day

Saturday, August 25th

Location:
Dennis and JoAnn Dickman Farm, 6480 S. 14000W Rd., Herscher, ILTopics will range from navigating state processing laws in Illinois, Iowa, Ohio, Michigan, Indiana, and Wisconsin to successful marketing of a quality product.
Time:
Country Breakfast served at 8:30 a.m.; program ends at 3:15 p.m. allowing for time afterwards to tour the Dickman operation
Cost: $20 (includes breakfast and lunch)
For more information contact:
Merrill D. Marxman (815) 937-323, ext. 104
merrill.marxman@il.usda.gov

AGRO-ECOLOGY
News and Perspectives

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News and Perspectives

AGRO-ECOLOGY

Science and Education for a Sustainable Agriculture

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Agritourism: Selling an Experience

by Bruce Wicks

Agritourism is an evolving term and not everyone agrees to the same definition of it. That is not surprising since it involves the merging of two of the state's largest industries–farming and tourism– and it is relatively untested.

Agritourism should be defined broadly and include as many revenue streams as possible. Because we are familiar with roadside stands and farmers markets, they come to mind quickly, but livestock and recreational land uses should also be included in our repertoire of travel attractions. Great examples are a petting zoo that travels around to fairs and special events and a very remote farm where marginal land was used to operate a trap and skeet shooting operation. In both of these cases the new profit centers did not replace other more traditional farm operations, but they did make a significant financial contribution.

Agritourism taps into the huge market of travelers that is often overlooked.

A Bright Future

Many trends across society point to a growing demand for Agritourism destinations.

- Strong demand for wholesome family oriented recreational activities.
- Growing concern for health promoting food products.
- Increase demand for highest quality produce from amateur chefs.
- Continued pressure on prices for traditional crops.
- More smaller farms.

continued on next page

Agro-Ecology News and Perspectives is published by the College of Agricultural, Consumer and Environmental Sciences, Agroecology/Sustainable Agriculture Program, University of Illinois at Urbana-Champaign (UIUC). This newsletter is designed to inform its readers about the well being of human and natural communities through the adoption of agricultural practices and farming systems that are economically viable, environmentally sound, and socially just. This issue was edited by Deborah Cavanaugh-Grant and Debra Levey Larson, designed by Scherer Communications and produced by Roberts Design Company.

Agro-Ecology News and Perspectives Editorial Committee: Shannon Allen (Macon County Soil and Water Conservation District), Juli Brussell (Illinois Stewardship Alliance), Rick Farnsworth (UIUC, Agricultural and Consumer Economics), Dan Faulkner (UIUC, Animal Sciences), Mike Gray (UIUC, Crop Sciences), Ted Funk (UIUC, Agricultural Engineering), David Onstad (UIUC, Natural Resources and Environmental Sciences), Bob Reber (UIUC, Food Science and Human Nutrition), Gerry Walter (UIUC, Human and Community Development) and Sherry Weaver.

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If you would like to receive future issues of Agro-Ecology News and Perspectives, contact Deborah Cavanaugh-Grant, (217) 968-5512, e-mail: cavanaughd@mail.aces.uiuc.edu.

- Expanding ethnic markets.
- Greater willingness to pay for quality food items.
- People are taking more but shorter trips.

Tourists spend billions of dollars annually and often do so spending more freely than they would while at home. Agritourism may not turn around large numbers of failing farm operations but the significance of this marketing niche has yet to be explored to its fullest potential.

Selling the Product and the Experience

Two factors distinguish Agritourism: the market and the product. For small businesses like farms, the market is customers that live beyond the reach of local media such as radio or newspapers. And since the customers are typically tourists, even if it is only for an afternoon outing, they are usually looking for entertainment. So, agritourism is not just about selling a product but selling an experience as well.

The product and the experience must be bundled into one package. This very important point is lost on many small businesses that rely on tourist revenues. For example, as a traveler have you ever experienced restaurant staff who are unfriendly or lodging operators who act as though you are taking a vacation just to stay in their facility? Hospitality or "agritainment" plays an integral part in creating the kind of travel experience that keeps customers coming back.

The Wizard of Oz theme was born one day when Randy Graham looked at the silo and commented that it looked like the Tin Woodman's head. The next day, Paul Curtis hired someone to paint it.

Signs direct visitors to parking areas at Curtis Orchard. An area of cherry trees was abandoned to make room for additional parking.

Agritourism can also be very profitable. Although, the enterprise may derive only a small proportion of revenue from the travel market, that 5-20% could be the difference in a business that is profitable and one that is not. For those direct marketing farm products **and** travel experiences, the benefits sought by this special market should be considered in the business planning process. Accessing and maximizing profit from tourists will require recognition of their travel motives and needs, a marketing/promotion strategy (with adequate costs attached) and an ability and willingness to partner with other industry players – the "tourism" in Agritourism.

Visitors to Curtis Orchard can measure themselves next to the giant apple

Curtis Orchard: Adding to the Agritourism Experience

What began with an apple orchard and few farm kittens has grown to include a petting zoo, a giant snow fence maze, a pumpkin patch, a huge gift shop and snack area which features apple slush and apple donuts and much more–all set in a whimsical Wizard of Oz theme. Today, Curtis Orchard attracts over 120,000 visitors annually, including more than 6,000 school children for orchard tours.

Paul and Joyce Curtis, along with their daughter and son-in-law, Debra and Randy Graham, have been adding attractions to their business for more than two decades. "We try to add something new every year–something our customers will like," said Joyce Curtis. "We noticed that the really little children liked the giant maze but they sometimes got scared when they couldn't see their parents once they got inside. So, this year we added Munchkin Land. It's a special smaller, shorter maze just for small children."

For more information visit: http://www.curtisorchard.com

More information is available on the Web

Ohio State University's Small Farm New Farm ANR Internet Resources Web page: http://newfarm.osu.edu

USDA Farmer Direct Marketing http://www.ams.usda.gov/directmarketing/

North American Farmers' Direct Marketing Association http://www.nafdma.com/

Direct Marketing and Related Topics, QB 97-02 Alternative Farming Systems Information Center: http://www.nal.usda.gov/afsic/

ATTRA (Appropriate Technology Transfer for Rural Areas): Entertainment Farming &Agri-Tourism http://attra.ncat.org/attra-pub/entertainment.html

Marketing Channels: Pick-Your-Own & Agri-Entertainment: http://attra.ncat.org/attra-pub/pickyour.html

Curtis Orchard uses professionally painted signs throughout the property to add to the Wizard of Oz theme.

Sustainability is Part of the Plan

A recent trend in the travel industry has been for sustainable development. There are too many examples of people developing tourism destinations in ways that destroyed the quality or uniqueness of the site and resulted in a boom-and-bust cycle. That lesson has been learned, and it was a natural for the industry to borrow and adopt a sustainable philosophy that depended upon preserving the resource, making a profit and maintaining an acceptable quality of life. The same thought processes that go into making decisions about sustainable crop production should meld seamlessly with tourism development efforts.

Working With the Travel Industry

Making connections with the travel industry and opening the doors to partnerships is also an important factor. The nearest Illinois Regional Tourism Development Office (TDO) or Convention and Visitor's Bureau (CVB) can, at a minimum, get you started down the right track to meeting the local players. The TDOs are designed to help businesses and organizations not served by a CVB to develop their tourism potential.

Why would the industry be willing to help a small new farm enterprise? The simple answer is that they want to promote a variety of quality destinations in their region. Remember that travelers want to be able to make convenient choices about what to see and do. The greater the number and diversity of destinations the better. Unfortunately, many areas of Illinois lack a critical mass of destinations for TDOs and the Illinois Bureau of Tourism to promote but your small contribution will be a valued part of the whole.

A fun entryway to the u-pick pumpkin patch at Curtis Orchard.

Educational Tours at Curtis Orchard: School children listen as Joyce Curtis explains why honeybees are important for pollination of apple trees and why and how to use a smoker in working with them.

State and local tourism agencies may help drive traffic to your site through their publicity efforts. Your greatest chance for success with them will occur when you provide the kind of destination they are proud to showcase. That means providing one that is of the highest quality possible. To test the quality of your operation, ask yourself the following questions:

- Are we meeting the traveler's expectations?
- Is it fun?
- Is there something new or unique to see or do?
- Are my staff and I always as hospitable as possible?
- Is my advertising message accurate and consistent?
- Are there signs so we can be found?
- Is the site safe and handicap accessible?

Agritourism Database

The Illinois Bureau of Tourism, the Illinois Department of Agriculture, the Central Illinois Tourism Development Office and University of Illinois Extension have joined forces to create an online database that can be used by the travel industry as well as individual travelers to locate Agritourism sites. If Agritourism is a part of your business plan and you are not in the Agritourism Database, please contact Bruce Wicks at (217)333-4410, e-mail: b-wicks@staff.uiuc.edu, or visit the Web site at www.agritourism.uiuc.edu

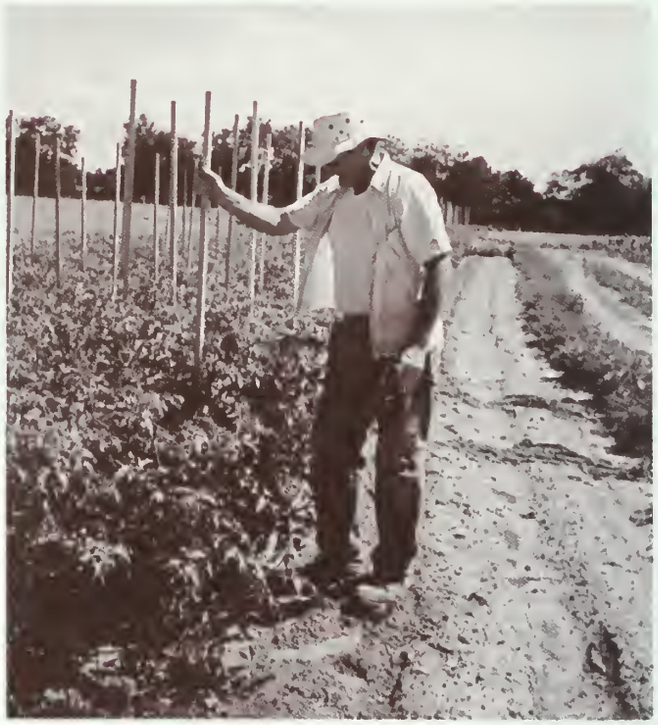
Bruce Wicks is an Associate Professor in the Department of Leisure Studies and Director of the Office of Recreation and Tourism Development for the University of Illinois Extension

Tips for Developing a Market

- *Start small but expect a large commitment/investment in the future. Get to know the new market, their likes and dislikes before making a very large commitment. Do your homework first!*
- *The tourism industry, like agriculture, is dependant upon many interrelated parts all working together to deliver a product. Learn the system and develop the partnerships.*
- *Your involvement can be as small or large as you want it to be. But, do it well and don't over-extend.*
- *You've heard it before---do a business plan!*
- *Assess yourself. I have heard more than once, "I love raising ____ or growing ____, it's the people I can't take." If that's the case, perhaps Agritourism is not for you. Do not start something you are unlikely to be good at no matter how profitable it may appear.*
- *Expect to spend a lot of time on it. Developing your market can be a frustrating job at times and it never ends. Think long term and be prepared to stick with it.*

First Fruits Produce–Creative Alternatives for a Family Farm

by Debra Levey Larson



Burt Asbill adjusts the stakes on tomato plants at his farm in Mahomet.

Gibson City has a grocery store but Mary Ann Sharp drives about 20 miles from Gibson City to Mahomet, Illinois in order to buy fresh vegetables from *First Fruits Produce*. Sharp had driven past the sign that advertised *First Fruits Produce* many times without stopping, but now said that she is a regular customer. "This is my third time here in the past two weeks! The vegetables are just incredible. There's just no comparison," said Sharp, "The flavors are so rich and wonderful. The freshness makes all the difference in the world."

First Fruits Produce is a small family-run business that includes a 50-acre farm surrounding a church on Route 47 just north of I-74. The land is farmed by Burt and Nancy Asbill and their oldest son, Barak. Burt Asbill farmed peaches and almonds in California for about 13 years and did not like the amount of chemicals he had to use on the crops. So, when they started farming in Illinois, they wanted to be more conscientious about what they used for weed and pest control. "In order to be certified organic, the land needs to sit without being farmed for three years, and we didn't have three years," said Nancy Asbill. "We want to farm as organically as possible so we farm sustainably."

"The first year, we just sold our produce at a farmers' market and roadside," said Nancy Asbill. "But with the roadside selling, there were too many interruptions," said Nancy Asbill. "We'd be out in the field and have to stop and run to catch the person coming up the drive to buy something. We also didn't like leaving everything out there in the heat."

A Store is Born

A creative arrangement grew out of that year of frustration. Two years ago the Asbills began leasing space at the rear of the church building, to use as a small country store. They also have a profit-sharing arrangement with the church based on sales. "In our first year of business, the community reception was quite good – very encouraging," said Burt Asbill.

When customers enter the Asbill's store, they see a counter with a scale and a dry erase board listing the items of produce available today with the price per pound and a small display of produce that was just recently added. "People used to come in and say, "Is the produce through that door?' They'd expect to see piles of produce to choose from like at the grocery store," said Burt Asbill. Although some of the produce is in the store on display, it is also common for one of the Asbills to walk out into the field to hand pick a customer's order. "We hope to have a refrigeration unit installed in the shop someday soon so we can keep even more in the store," he added.

Country Store/Grocery Store

The competition from traditional grocery stores is steep. "Our hope was that people could have fresh produce available, but it's hard to get people away from the grocery store," said Nancy Asbill. "Grocery stores stock produce year-round because they bring it in from California. We only sell whatever is in-season." They also can only sell whatever produce happens to be ripe that day. "Everyone today has been coming in asking for tomatoes and ours aren't ready yet. They will be in a couple of days, but people want them today."

"The Asbills have added handmade aprons, soaps and a large hutch filled with jars of honey, salsa, jams, processed organic foods and gift baskets that customers can buy or order custom made."

The appearance of some of the sustainably-grown produce has been an obstacle. "We've been brainwashed into a certain aesthetic quality of what food is supposed to look like," said Burt Asbill. "For instance, the cauliflower in the grocery stores are bleached so they look white. When a little sun catches our cauliflower it purples out a little and people aren't used to seeing cauliflower look that way. Personally, I think it's more attractive. But we have to educate customers about things like that."

The small country store is also limited in variety compared to what a grocery store can offer. "We're just selling what we grow," said Burt Asbill. "We do bring in some peaches and other fruits from outside. And it would probably be to our benefit financially if we brought in other foods, but the whole idea is to sell foods were comfortable with–foods that are grown using fewer chemicals and are fresh-picked like ours are."

One fresh produce item that has been particularly popular is mixed salad greens sold in plastic bags. Nancy Asbill mixes 5 or more varieties together. It may include varieties like arugula, mustard greens, freckles, oakleaf, red salad bowl and samantha and others. "It's unique–not like what you find in a grocery store and people really like it," she said.

The Asbills have added handmade aprons, soaps and a large hutch filled with jars of honey, salsa, jams, processed organic foods and gift baskets that customers can buy or order custom made. Nancy Asbill said that the extra items help to build sales and add to the country store atmosphere that people like. She has one customer who just comes in to buy boxes of green tea.

Taking the Show on the Road

Every Saturday from mid-May through the month of October, *First Fruits Produce* takes their show on the road to the Farmers' Market in Urbana, about 15 miles east of Mahomet. The Urbana Farmers' Market has a long-standing tradition, drawing a large, loyal clientele. It has become another good way for the Asbills to sell their produce. But Nancy Asbill said that the space rental cuts into their profit and they are in direct competition with the other vendors. "Lots of people have been there five to six years and have a lot of spaces," she said. "We're just a little guy. This is our third year so we just have two spaces."

Getting a Foot in the Restaurant Door

One of best additions to the business has been marketing produce to several local grocery stores and restaurants. "The first year, I visited the restaurants in January and asked them what they wanted. That first year, we grew just about everything they asked for," said Nancy Asbill. "Then the next year, I put together a sort of catalogue using photos of produce from seed magazines." She added that restaurants are accustomed to paying certain prices for produce so she has to be competitive and match those prices or the restaurants won't buy from them.

The produce sold to restaurants is grown in raised beds specifically developed for this business venture. "In the raised beds I can control the environment," Nancy Asbill said. "I brought in special black soil and I don't spray the plants at all. I can use the best compost and organic techniques because it's a small, manageable area...not like out in the fields."

For the most part, Asbill says that she has to take the initiative if she wants to sell to restaurants. "Some restaurants call and ask what I have but mostly I call and tell them what we have. I say, "I'll be picking blueberries today,' and some restaurants will create an item on their menu, incorporating the fresh produce I can bring them that week."

So, between selling at the country store, to restaurants and at the farmers' market, which is most profitable? Nancy Asbill said that if the store catches on, that will be the biggest money-maker for them. "It takes less time and less gas to sell at the store because the produce is right here–we don't have to take it anywhere. But for now, the farmers' market and restaurants have been a great source of income for us. It's a big endeavor and a lot of work, but it's rewarding. We've met a lot of wonderful people."

Debra Levey Larson is a writer for the College of Agricultural, Consumer and Environmental Sciences at the University of Illinois.

Nancy Asbill bags a pound of green beans for a customer at the farmers' market in Urbana.

On the Research Front

Researchers at the University of Illinois are studying some of the ways that technology and the Internet are impacting buying habits and trends.

Technology's Impact on Rural Areas Studied

Researchers in 11 states, headed by Hilda Lakner, an associate professor in the Department of Agricultural and Consumer Economics, are looking at how new technology and new ways of doing traditional tasks impact rural America. The project's goal is to help improve the quality of life in rural areas.

The five-year project will examine the impact of television and Internet shopping on rural consumer access to food and fiber products.

"With many small-town retail operations disappearing, it is more and more likely that people in small communities will be doing more shopping for goods on television or the Internet," said Lakner. "We're looking at how people perceive and use this technology now and we will be following up to see what adjustments they make over the next few years."

In the fall of 2000, Clinton, Illinois was one of several sites used for a study on attitudes. That portion of the project found that exposure to television and Internet sources for products increased the willingness to use those services.

Lakner also described another aspect of the project, "We're hoping to identify the factors that make someone an innovator in terms of adapting to new technology," she said. "We're interested in looking at where people are now and how they change over time."

The key potential find of the 11-state study in Lakner's view is not so much the change in attitudes but the demographic information it will assemble about those who embrace change and those who do not.

"We will have a better idea at the end of this study about the attitudes and perceptions of innovators in a community," she said. "I think this information will be the biggest long-term contribution of the study."

For more information contact:
Hilda Lakner at (217)244-3142,
e-mail: h-lakner@ux6.eso.uiuc.edu

Rosy E-Commerce Projections Tested

Optimistic projections for the growth of Internet shopping and purchasing may be justified, according to a recent study by Michael Ward, an assistant professor in the Department of Agricultural and Consumer Economics. Ward says that e-commerce may well fulfill the expectations of some of its promoters.

"The analysis we conducted confirms that projections of e-commerce growth that can seem fantastic can, in fact, be sustained," said Ward.

Ward's speciality is telecommunications issues and the e-commerce research is a chapter in the book, *Forecasting the Internet: Understanding the Explosive Growth of Data Communications*. Using economic analysis tools, Ward studied trends in several areas, including the number of people gaining Internet access, the number of suppliers offering goods and services over the Internet, and how experience on the Internet affected consumer behavior.

"The study indicated that as people become more experienced in on-line shopping, they do more of it," Ward said. This consumer behavior provided a base line for judging the future of e-commerce.

"If Internet access in the United States doubles, as it may well do, and if on-line shoppers become more comfortable with e-commerce, as the study indicates is likely, then e-commerce could double every year in dollar volume," Ward noted.

However, Ward said that even if the most optimistic projections come true, e-commerce will still only account for about 5 percent of all retailing dollars.

For more information contact:
Michael Ward at (217)244-5667,
e-mail: ward1@uiuc.edu

Research updates are provided by Bob Sampson, Information, Technology and Communication Services, College of Agricultural, Consumer and Environmental Sciences at the University of Illinois at Urbana-Champaign.

BOOK REVIEWS

Selling Points: The New Farmers' Market Tells All

The New Farmers' Market: Farm-Fresh Ideas for Producers, Managers, and Communities is one of those gotta-haves for any grower who is currently part of a market, responsible for any aspect of running one, or thinks there is a farmers' market lurking somewhere in the future.

Vance Corum, Marcie Rosenzweig, and Eric Gibson have produced a book that is more than another how-to. Instead, the book looks at what makes farmers' markets appealing to producers, consumers, and whole communities. By conveying the special qualities of community based, open-air markets–the mixture of scents, colors, sounds, faces, and novel buying opportunities–the authors encourage producers to see the market from the customers' point of view.

What is the best balance of produce and value-added products like syrup, baked goods, and preserves? Should non-agricultural vendors be part of the mix? What is the best way to display products to capture attention?

The book also covers the decisions growers need to make to get the best mileage from their market stall, including choosing what to grow and sell, carving out a niche, standing out in a crowd, and developing customer loyalty. The authors offer specific examples of how different farmers use free samples, signage, and even a touch of theater to sell their goods–we meet a flower grower in Arkansas who keeps things interesting by making made-to-order bouquets on the spot, and he does it with such flair that "people will stand there hour after hour and watch us make bouquets."

As America becomes increasingly homogenized, with chain stores and malls dominating the retail horizon, the farmers' market offers something genuinely different—it strengthens urban-farm connections, delivers healthy food at reasonable prices, and tends to foster face-to-face transactions that develop into trust. With its focus on salesmanship and marketing, *The New Farmers' Market* offers a framework for growers who are interested in selling their farm products themselves, and also covers logistics–establishing a new market, legal and insurance considerations, and management strategies–but with the accent on positive models.

The New Farmers' Market is published by New World Publishing with support from the Sustainable Agriculture Network, the outreach arm of SARE; Credit card orders can be sent to sanpubs@uvm.edu or can be placed by calling (802) 656-0484.

Smart Farmers Innovative, Environmentally Minded Producers Featured in New Book

Driven by economics, concerns about the environment or a yearning for a more satisfying lifestyle, farmers and ranchers across the United States have embraced new approaches to agriculture.

They raise beef cattle, dairy cows, hogs and poultry using pasture-based systems that reduce the cost of production in a more humane environment. They produce grain in innovative rotations with other crops to break insect pest cycles and reduce pesticide use. And they grow fruit and vegetables, employing earth-friendly techniques to build the soil, then sell their products at farm stands and markets for premium prices to an appreciative public.

Fifty of their stories are captured in a book just published by USDA's Sustainable Agriculture Research and Education (SARE) program. *The New American Farmer*, a collection of in-depth interviews with farmers and ranchers, describes diverse operations around the country and details the effects of those systems on farm profitability, quality of life, rural communities and the environment. This "new American farmer" does things differently - with measurable results.

CALENDAR

Small Farm Trade Show and Conference, November 1-3, 2001, Columbia, MO —sponsored by *Small Farm Today* magazine.
This is the largest annual small farm show in the United States. Last year almost 3,500 attended to learn about ideas and information on both traditional and alternative income opportunities for the family farm.

Contact: Small Farm Today at: 1-800-633-2535.

Working Landscapes in the Midwest: Creating Sustainable Futures for Agriculture, Forestry & Communities, Nov. 8-9, 2001, Delavan, WI
This conference will explore practices and policies that promote land-based economic activity to sustain families, communities, and ecosystems, while also providing multiple benefits to society. The conference goal is to engage participating stakeholders in dialogue to identify means for achieving long-term economically and environmentally sustainable action strategies and policy ideas for participants to take home, leading to individual and collective land and watershed stewardship in their own regions.

For more information contact: Steve Light, (612) 870-0453, stlight@iatp.org or Dave Carvey, (608) 224-3009, dcarvey@mw.nrcs.usda.gov or visit: http://www.forestrycenter.org/library/admin/uploadedfiles/Midwest_Working_Landscapes_Conference_2.htm

Farming on the Edge: Conservation, Community and Commerce
November 12-14, 2001 in St. Charles, IL.
Most of the food we eat is grown in or near metropolitan areas. Sprawling development into rural and suburban areas threatens the future of American agriculture. But it doesn't have to be that way. American Farmland Trust (AFT) is presenting a national conference to foster better understanding of how agriculture and an increasingly urban environment can complement each another – benefitting both land and people.

Contact: Eileen West, American Farmland Trust Program Coordinator at (413) 586-9330 ext.27; ewest@farmland.org.

continued on back

Book Reviews, continued

By publicizing their stories, SARE demonstrates that sustainable farms and ranches are no longer few and far between. Instead, they are viable throughout American agriculture.

"Each of these farmers and ranchers is unique and has a fascinating story to tell," says SARE Director Jill Auburn, who oversees a grants program that funds researchers and farmers. "The book gathers an astounding diversity of 'new' farmers, and they are just the tip of the iceberg. There are hundreds, even thousands, of more innovators like them across the country."

There's something in the collection for everyone. From a banana producer in Hawaii to a potato farmer in Maine - and almost every state and commodity in between - the producers featured in The New American Farmer are meeting their financial, stewardship and lifestyle goals. Many producers in the book raise some of the key crops grown in Illinois: corn/soybeans, vegetables, dairy and hogs.

To reprint profiles in newspapers or magazines, go to http://www.sare.org/newfarmer. For a free review copy of the $10 book or the $5 CD-ROM, call (301) 504-5230.

SARE Conference

The National Sustainable Agriculture Research and Education (SARE) Conference will be a "rolling conference" with two days of on-site tours in and around Raleigh, North Carolina on October 23-26, 2002. Based at the Sheraton Imperial Hotel and Convention Center in Raleigh, the conference will roll through farms, markets and research stations on comfortable chartered buses.

While on the bus, speakers will address issues related to the six conference themes. Posters will be displayed at the Sheraton. Posters should address either success stories or research results based on the conference themes.

The conference themes are:

- Urban sprawl and sustainable agriculture
- Organic research, marketing and certification
- Direct marketing opportunities
- Production systems in transition
- Opportunities for limited-resource farmers
- Environmental issues and sustainable agriculture

Deadline for proposals is Monday, October 29, 2001. Presentations will be selected on the basis of quality, innovation and relevance to conference goals. Special consideration will be given to papers based on SARE-funded work. Persons whose proposals are accepted will be notified in January 2002. A final version of the presentation will be due by March 1, 2002.

For more information visit: http://www.griffin.peachnet.edu/sare/OTR/otr.pdf

AGRO-ECOLOGY
News and Perspectives

University of Illinois at Urbana-Champaign
College of Agricultural, Consumer and Environmental Sciences
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Sustainable Farm Economics

by John Ikerd

An Introduction to Farm Economics

Much of my early career as an extension marketing and farm economist was spent helping farmers maximize profits by managing the various types of risks associated with specialized large-scale production of standardized commodities.

During the farm financial crisis of the 1980s, I began to realize that the industrial approach to farm management was driving farmers out of business. Our new technologies and management techniques were expanding the ability of farmers' to produce far faster than consumer demand. Farm profit margins grew narrower with each new round of technology and each farmer had to increase their size of operation just to survive. As the farms grew larger, they were forced to grow fewer in number. Some had to fail so that others might "succeed." This type of farming was not sustainable, at least not for farmers.

The Cost of Specialization

As farms became more specialized profits increased. Farms became more profitable by shifting land, labor, capital, or management from enterprises in which the farm is least efficient to those in which the farm is most efficient. In addition, increased specialization may allow the farmer to achieve added efficiencies through utilization of larger or more specialized buildings and equipment, standardizing production processes and allowing an increase in scale of operation.

However, increased specialization often results in increased risks. By

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If you would like to receive future issues of Agro-Ecology News and Perspectives, contact Deborah Cavanaugh-Grant, (217) 968-5512, e-mail: cavanaughd@mail.aces.uiuc.edu.

specializing in one crop, or a few crops, a farmer becomes more vulnerable to a crop failure, due to weather or pest problems, or to depressed market prices for any of the crops produced. By specializing in one species of livestock, or one phase of production, a producer is more vulnerable to disease, poor performance, or a cyclical downturn in prices.

In addition, specialization tends to increase financial risks. Financial risks are related to the ability of the farm to meet its debt repayment commitments and to production and market risks. Farms that rely more on purchased inputs, such as seed, feed, fertilizer, chemicals, etc., rather than inputs produced on the farm, increase the amount of out-of-pocket costs that must be paid up front, or at least at harvest time. As they increase investments in larger or more specialized buildings and equipment, they often borrow money that must be repaid on a regular basis. Consequently, specialized, high-input, high-investment farmers tend to rely on government commodity programs and crop insurance to protect them from production risks.

Price Takers Rather than Price Makers

Industrial farmers are price-takers in the marketplace. They produce standardized commodities, and thus, have no influence over the prices they receive. One farmer's US No. 1, hard red winter wheat is the same as another's, as far as buyers are concerned, which means that no farmer can get a price higher than any other. Prices vary over time with changing supply and demand, but farmers are price takers, not price makers.

The only marketing decisions conventional farmers make is when to establish a price for the things they produce. They may use forward contracts or options and hedging in the futures markets to manage price risks. By using such tools, farmers can price something before delivery, price at delivery, and in some cases, defer pricing until after delivery. They may set a specific price, a price range, or a minimum price. But, the price is always one that is offered by the market–the farmer can only take it or leave it. In the face of such risks, some farmers resort to comprehensive production contracts that promise the farmer a fixed amount of return per unit of production. The farmer, in essence, becomes a landlord and contract laborer.

Specializing in one species of livestock can bring additional economic risks for the farmer

Everyone Loses

The economics of industrialization not only encouraged farmers to exploit each other, but also encouraged them to exploit the land. Soil erosion rates rose dramatically during the 1970s, as farmers farmed "fence-row-to-fence-row" and then tore out and farmed the fence rows. Commercial fertilizers and agri-chemicals, necessary to support industrialization, also raised serious

questions concerning the quality of water in underground aquifers and streams. Organic farmers went to Washington DC in the mid 1980s with demands that USDA support their more ecologically sound approach to farming. By the early 1990s, many people were beginning to demand a more ecologically sustainable approach to farming.

The impact of agricultural industrialization on the social fabric of rural areas rose the public consciousness in the farm financial crisis of the 1980s. Once prosperous farming towns withered and decayed as large numbers of farm families were forced off the land. The land was still farmed, but there were fewer people to buy groceries, school clothes, hardware, and hair cuts in the local business community. In addition, the larger industrial farms often bypassed the rural community in order to save a few dollars on input costs or to get a few more dollars out of their products. Ultimately, the corporate takeover of hog farming with their giant "hog-factories" raised the consciousness of the public in general to the destruction of the social fabric of rural America by the industrialization of agriculture.

Today, farmers, rural residents, and society in general are demanding a more socially responsible, ecologically sound, and economically viable system of farming. The challenge today is to help farmers build a more sustainable agriculture. Farms of the future must be economically sustainable for the farmer as well as consumers and society in general. The profitability of farming cannot be sustained through exploitation of the land or of other people. To be economically sustainable, it must conserve and protect the natural resources upon which its long run productivity must depend. To be economically sustainable, it must contribute to the social and cultural quality of life for farm families and rural residents as it provides an adequate supply of safe and healthy food and fiber for society in general.

The corporate takeover of hog farming with their giant "hog-factories" raised the consciousness of the public.

Specialization versus Biodiversity

Increasing specialization has also led to loss of biodiversity, and to increasing vulnerability of livestock and crops to insects, parasites, diseases and other pests, and to adverse growing conditions requiring ever increasing reliance on costly off-farm inputs. Increasing specialization has led to loss of economic diversity, and thus, to increasing vulnerability to depressed market prices or rising input costs of the specific commodities being produced requiring ever increasing reliance on commercial risk management strategies or contract farming.

Farmers find they lack the expertise or market discipline needed to use commodity markets risk management tools and are at a competitive disadvantage to large corporate firms when "negotiating" comprehensive production contracts.

However, production, marketing, and financial risks can be managed by applying the fundamental principles of diversity. In managing biological diversity, some important considerations include selecting a combination of crops and livestock enterprise spatially, sequentially, and temporally in order to break pest cycles or manage pest populations, maintain soil health and fertility, and efficiently utilize available resources. By relying on diversity rather than off-farm inputs to maintain productivity, farmers reduce their out-of-pocket, variable costs. However, diverse systems typically require more labor and management which typically are committed and thus fixed in nature. So farmers may increase their fixed costs relative to variable costs as they substitute labor and management for off-farm inputs.

Even if total costs remain essentially unchanged, however, farmers can significantly reduce their financial risks by relying less on off-farm, purchased inputs and more on on-farm, owned resources. On such farms, most short-term losses due to adverse weather or markets can be absorbed by accepting a smaller return for labor and management during years of adversity. Costs of purchased inputs, on the other hand, must be paid, regardless of whether the farm generates sufficient profits to do so.

Keeping the Profit on the Farm

Consumers today only spend about a dime of each dollar they earn for food and the farmer gets to keep less than a penny out of that dime. Eight cents goes for processing, transportation, packaging, advertising, and other marketing services. The other penny goes for purchased inputs. But, food products today must be mass-produced and mass-marketed in order to put them in the supermarket in order to achieve the economies of scale of industrial food production. As a consequence, most foods in the supermarket today are selected far more for their adaptability to machine harvesting, efficient processing, transportability, and shelf-life than for taste, tenderness, or nutrition. In addition, mass-produced foods must be targeted to the "most common" consumer tastes. The economic savings derived from mass-production come from standardization, not from variety. But, we don't all have the same tastes and preferences, and thus, we value things differently. Sustainable farmers must give consumers more of the things they value most.

The weaknesses of industrial agriculture provide opportunities for farmers to develop sustainable markets, which may be essential in sustaining the profitability of their farming operations. Farmers who sell direct to customers in local markets have an opportunity to select crop varieties or livestock breeds for superiority in taste, tenderness, healthfulness, and nutrition rather than handling, transportation, and shelf-life attributes. They can sell their products while harvesting products at their peak of quality and market fresh to local customers. Such advantages cannot be duplicated by industrial production systems, thus giving local farmers a sustainable market advantage.

John Ikerd is a University of Missouri emeritus professor of agricultural economics.

This article was excerpted from a presentation at the Holistic Resource Management of Texas Annual Conference 2001, Systems in Agriculture and Land Management, Fort Worth, Texas, March 2-3, 2001.

Other articles written by Ikerd on the the economics of sustainability including the entire article from which this excerpt was taken are available on the Web at: http://www.ssu.missouri.edu/faculty/jikerd/papers/default.htm

Titles include:

- *Organic Agriculture Faces the Specialization of Production Systems*
- *Rethinking the Economics of Self-Interests*
- *The Case for a Bill of Rights for Sustainability*
- *Small Farms are "Real" Farms*
- *Toward an Economics of Sustainability*
- *Sustaining the Profitability of Agriculture*
- *The Role of Marketing in Sustainable Agriculture*

Shoppers enjoy bargains at a farmers' market in Champaign, Illinois.

Publicly Funded Agricultural Research and the Changing Structure of U.S. Agriculture
Committee to Review the Role of Publicly Funded Agricultural Research on the Structure of U.S. Agriculture, Board on Agriculture and Natural Resources, National Research Council, approx. 150 pages, 2001.
Visit: http://www.nap.edu/books/0309076161/html/

Publications Available from Appropriate Technology Transfer for Rural Areas (ATTRA)

Direct Marketing
This publication on direct marketing alternatives with emphasis on niche, specialty and value added crops features many farm case studies, as well as information on enterprise budgets and promotion/publicity. A new section discusses implications of Internet marketing and e commerce for agriculture.
Visit: http://www.attra.org/attra-pub/directmkt.html

Evaluating a Rural Enterprise
Evaluating an enterprise boils down to asking a series of good questions. Among these questions are: Do I have the resources to do this? Do I really want to do this? Do I have the experience and information to do this? How much profit can I make? How will I market the products? This publication seeks to provide enough information to help you judge whether a new enterprise is right for your operation, and a resource section of additional information on relevant topics.
Visit: http://www.attra.org/attra-pub/evalrural.html

Farmers' Markets
Farmers' markets are becoming increasingly popular as small growers are discovering the advantages of marketing directly to consumers. This publication is a resource for those who want to organize a farmers' market or sell at one.
Visit: http://www.attra.org/attra-pub/farmmrkt.html

Holistic Management:
A Whole-Farm Decision Making Framework
This publication serves as an introduction to holistic management and provides resources for further information. Holistic Management is a decision making framework that assists farmers and others in establishing a long-term goal, a detailed financial plan, a biological plan for the landscape and a monitoring program to assess progress toward the goal. Holistic Management helps managers to ask the right questions and guides them in setting priorities. In holistic financial planning, profit is planned at the beginning of the year. This is in stark contrast to conventional financial planning where the net profit is often non-existent or a small amount left over once expenses are accounted for.
Visit: http://www.attra.org/attra-pub/holistic.html

Alternative Marketing Of Pork
This publication explains why sustainable hog producers need to consider alternative marketing of their pork. Sustainable hog producers are creating product that many consumers can't find in their grocery store, but want to buy. Consumers perceive sustainably raised pork to be healthier to eat and are willing to pay hog producers more for raising pigs in a manner that is humane, helps sustain family farms, and is more environmentally friendly than conventional production methods. Direct marketing and niche markets are some alternative marketing strategies discussed. Legal considerations, trademarks, and processing regulations are explained. Sources of additional information are also provided.
Visit: http://www.attra.org/attra-pub/altpork.html

Alternative Beef Marketing
This publication explores marketing alternatives for small-scale cattle ranchers who would like to add value to the beef they produce. Part One discusses methods for adding value within the conventional marketing system, including retained ownership and cooperative marketing. Part Two introduces alternative marketing strategies, including niche markets for "natural," lean, and organic beef. Production considerations for pasture-finished beef are given special attention. A section on direct marketing focuses on connecting with consumers and developing a product. Processing and legal issues are also covered. Two case studies from a UC-Davis report including and economic analysis is available as an additional resource by calling ATTRA and requesting the print version enclosures for this publication. A list of resources at the end of the document provides suggestions for further reading, contact information for several producers and marketers of "alternative" beef, and Web pages of interest. This document is intended as a beef-focused supplement to ATTRA's Alternative Meat Marketing, which presents in greater depth the many issues and challenges associated with small-scale meat sales.
Visit: http://www.attra.org/attra-pub/beefmark.html

Alternative Meat Production
This publication offers general information on alternative meat marketing. Topics include pitfalls to be aware of, production and processing, different types of direct marketing options, legal and regulatory considerations, and information on differentiating products through organic certification, natural and environmentally sound production, and targeting ethnic and religious markets. Information on production and marketing of meat products from specific species is also available from ATTRA (see Related ATTRA Materials) and from other sources (see Resources).
Visit: http://www.attra.org/attra-pub/altmeat.html

Appropriate Technology Transfer for Rural Areas (ATTRA)
P.O. Box 3657
Fayetteville, AR 72702
Phone: 1-800-346-9140, FAX: (501) 442-9842
Web address: http://attra.ncat.org/index.html

Environmental Farm Analysis and Planning: A Whole Farm Planning Training Exercise Designed for Extension and NRCS Personnel

by Bill Hargrove

The purpose of this project was to train County Extension Agents, Natural Resources Conservation Service (NRCS) field personnel, and other federal, state, and local personnel to use the River Friendly Farm Environmental Assessment (RFF) tool. This self-assessment tool can help farm operators be proactive about environmental and economic issues on their farms using a whole farm perspective.

Five farms within high priority watersheds in need of restoration were identified as sites for on-farm training and use of the RFF tool. After securing the cooperation of the farm families, we introduced the RFF assessment tool to them and asked them to complete the self assessment with their families, giving them freedom to focus on whatever issues they identified. After the self assessment was done, a farm financial analyst worked with each family to develop a balance sheet, cash flow statement, and enterprise budgets. This information was then shared back with the farm families and used in a training workshop with the farm families' active participation. For each two-day training, the first day was spent introducing the RFF tool, broader whole farm planning concepts, the Finpack assessment, and touring the farm with the farm family, allowing for participant and farm family interaction about farm goals and issues. Day two began with an introduction to the environmental and economic issues the farm family had identified, and then participants spent several hours in breakout sessions developing options to address the issues. After the morning session, breakout teams identified options for the farm family.

Farm families who participated were very appreciative of the process and the identified options for sustaining or improving their operation.

Five training programs were completed in December, 2000; four additional training programs are planned for November and December, 2001. Farm families who participated were very appreciative of the process and the identified options for sustaining or improving their operation. They recognized a need to further clarify farm and quality of life goals before moving forward. Training participants also seemed to very much appreciate the experiential learning process using actual farm operations with real issues and nonsustainable situations - rather than something abstract taught in a classroom setting. A new appreciation was gained for the link of environmentally sound (are recommended Best Management Practices (BMP) always the best?), socially responsible (family quality of life issues), and financially viable (how much is enough?) aspects of a family farming operation. Participants left the training sessions with a high level of energy to make use of these tools with farm families in their respective locales.

Bill Hargrove is a professor at Kansas State University and Director of the Kansas Center for Agricultural Resources and the Environment (KCARE). KCARE was established to aid in the study of the interaction of agriculture and the environment. KCARE provides the building blocks to identify relevant and fundable research areas, and establish interdisciplinary working groups between KSU and organizations outside of KSU. For more information contact William L. Hargrove at (785) 532 7103; email: bhargrov@oznet.ksu.edu or visit: http://www.ksu.edu/kcare/

Professional Development Program to Promote Sustainable Ag

The Sustainable Agriculture Research and Education (SARE) Professional Development Program (PDP), authorized in Title XVI of the Food, Agriculture, Conservation and Trade Act (FACT) of 1990, was developed to meet the sustainable agriculture professional development needs of Extension, NRCS, Farm Service Agency (FSA) and other agricultural educators. The overall goal of the program is to provide continuing education in sustainable agriculture concepts and practices to enable educators to respond to the future needs of farmers, ranchers and the public. The anticipated long-term outcome of the PDP is an increase in the number of farmers and ranchers adopting sustainable agricultural practices and systems.

Between 1994 and 1999, the North Central Region (NCR) SARE PDP consisted of three areas: (1) regional training program, (2) state sustainable agriculture professional development plans and (3) competitive grants. The regional training program focused on developing the capacity of a diverse core of educators throughout the region in sustainable agriculture concepts and practices, who would then conduct workshops within their local area or state.

Topics addressed in the regional training program included whole farm planning, ecological approaches to agriculture, watershed management and successful strategies for adult learning environments. Training sessions were participatory, interactive, and led by a variety of educators, including farmers and ranchers, non-governmental organization staff, university faculty and private sector representatives.

The regional training program sponsored 10 train-the-trainer workshops in 10 states (including Illinois), involving more than 850 educators, including representatives from extension in all North Central region states, NRCS, state agencies, FSA, non-governmental organizations, and farmers and ranchers. A series of resource manuals and educational materials were produced at each workshop, distributed to all participants and are still available for use in professional development programs at the state or local level.

Besides the regional training program, the PDP also provided support for the development of state sustainable agriculture strategic plans in 1994. The Illinois plan was developed with support from interested stakeholders from the agricultural community — farmers, non-governmental organizations, university and agency personnel — and was intended to guide overall activities in sustainable agriculture (with an emphasis on professional development activities). Following the development of this plan, funds have been made available on a yearly basis to implement the plan under the guidance of the state sustainable agriculture coordinator, Deborah Cavanaugh-Grant. Activities supported under the plan have included the development of a Web site, a monthly electronic newsletter, a quarterly publication, continuing education in sustainable agriculture content areas for extension educators, NRCS and others, and field tours and demonstrations highlighting the practical application of sustainable agriculture concepts.

The competitive grant component of the NCR SARE PDP has resulted in 90 projects totaling $4.7 million between 1994-2001. In 1998, Illinois received its first PDP grant for the project, *Introduction to Management Intensive Grazing Systems Workshops and Resource Manual for Educators.* Two projects were funded in 2000, (1) *Sustainable Approaches to Aquaculture Production and Marketing* and (2) Participatory *Web site Development for Soil Quality Education and Assessment to Improve Agroecosystem Management.*

In 1999, the NCR SARE Administrative Council reoriented its efforts and funds to focus on promotion of sustainable agriculture professional development activities at the local, state and sub-regional level, and discontinue the regional training program.

For more information about Illinois activities, check out the ASAP Web site, http://www.aces.uiuc.edu/asap/training/training.html (Illinois Professional Development Program, Plan of Work, 2000-2001).

For more information about the NCR SARE Professional Development Program, http://www.sare.org/ncrsare/pdp.htm.

A Dollar for Dollar Comparison of Cropping Systems

The Stewardship Farm Study

The Stewardship Farm is a working farm dedicated to using research, observation, and demonstration to develop and promote agricultural systems that: foster stewardship of natural resources, strengthen the economic health of farmers and rural communities, and contribute to a healthy food supply.

The farm is located in Piatt County, in East-Central Illinois, one mile north of the village of Cerro Gordo. The core of the farm is owned by Allen and Doug Williams, and operated by Allen Williams, who grew up on the farm and has over 20 years of farming experience. Much of the land is terraced and is used for corn and soybean production. The farm also includes ten acres of restored prairie as well as several miles of windbreaks, hedgerows, and waterways.

FARMING SYSTEM FIVE YEAR AVERAGE ITEMIZED COST SUMMARY, $ PER ACRE

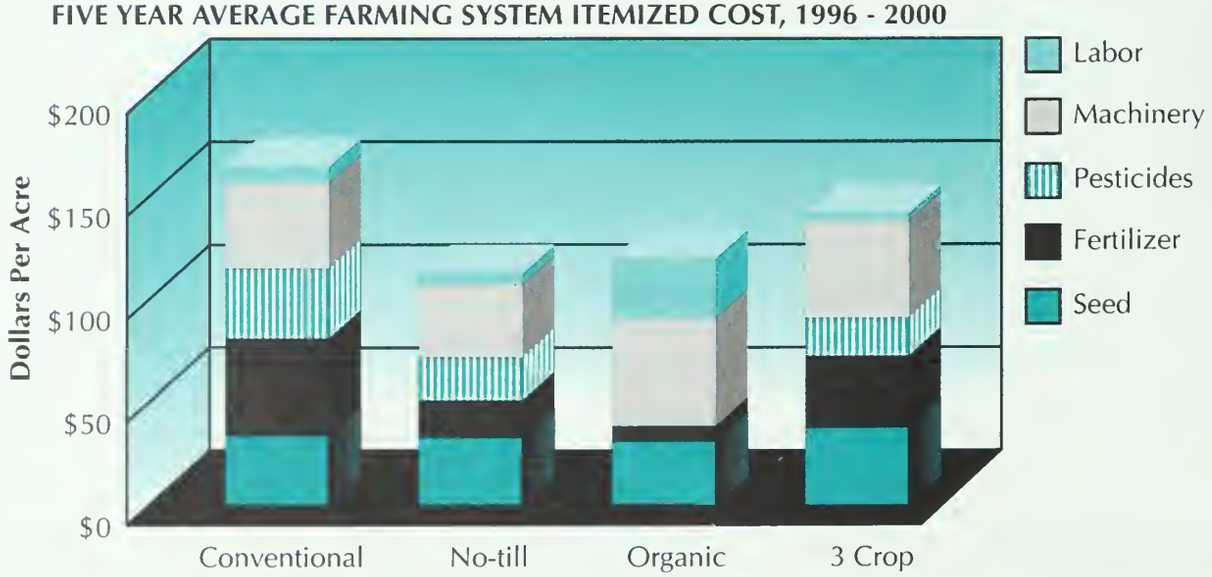
Item	Conventional	No-till	Organic	Three Crop
Seed	$27	$27	$26	$33
Fertilizer	$48	$18	$8	$35
Pesticides	$36	$20	$0	$19
Machinery	$47	$38	$54	$50
Labor	$5	$4	$24	$4
Total Cost	**$162**	**$107**	**$112**	**$141**

The principle project on the Stewardship Farm is the Farming Systems Comparison Study. The long-term objectives of the Farming Systems Comparison Study are to compare the on-farm and off-farm economic, environmental and social consequences of four farming systems on 500 acres of adjacent fields with similar soil types and landscape features: Conventional, No-till, Three Crop, and Organic. The year 2000 was the fifth year of the study although the Three Crop System was added in 1999.

Farming Systems Descriptions

Conventional: corn-soybean rotation. The entire acreage of this system is planted to either corn or beans each year. For the first four years of the study, the Conventional System used reduced-tillage. In 1999 the terraced part of the system (35.7 acres) was no-till planted to soybeans. The remaining 76 acres were tilled as it has been in the past. The Conventional System was all planted to corn in 2000. The farmer applied an average of 158

FIVE YEAR AVERAGE FARMING SYSTEM ITEMIZED COST, 1996 - 2000



pounds per acre of fertilizer nitrogen to the corn fields; herbicides applied at labeled rates.

Modified No-till with cover crops (AKA, No-till System): corn-soybean rotation with a wheat or cereal rye winter cover crop. This system was also changed in 1999. It used to be strictly no-till. As of 1999 the corn is spring tilled and the soybeans are no-till. 147 pounds per acre of fertilizer nitrogen on corn in 2000, herbicides often applied at one-half of the labeled rates, planted with approximately half white corn and half soybeans every year.

Organic: a four crop rotation of corn, soybean, cereal, legume green manure; no pesticides applied; nitrogen needs met with legumes, and starting in 2000, compost was added to one of the organic fields. These fields have been certified organic since 1994.

ITEMIZATION OF FARMING SYSTEMS' COSTS FOR 2000, $ PER ACRE

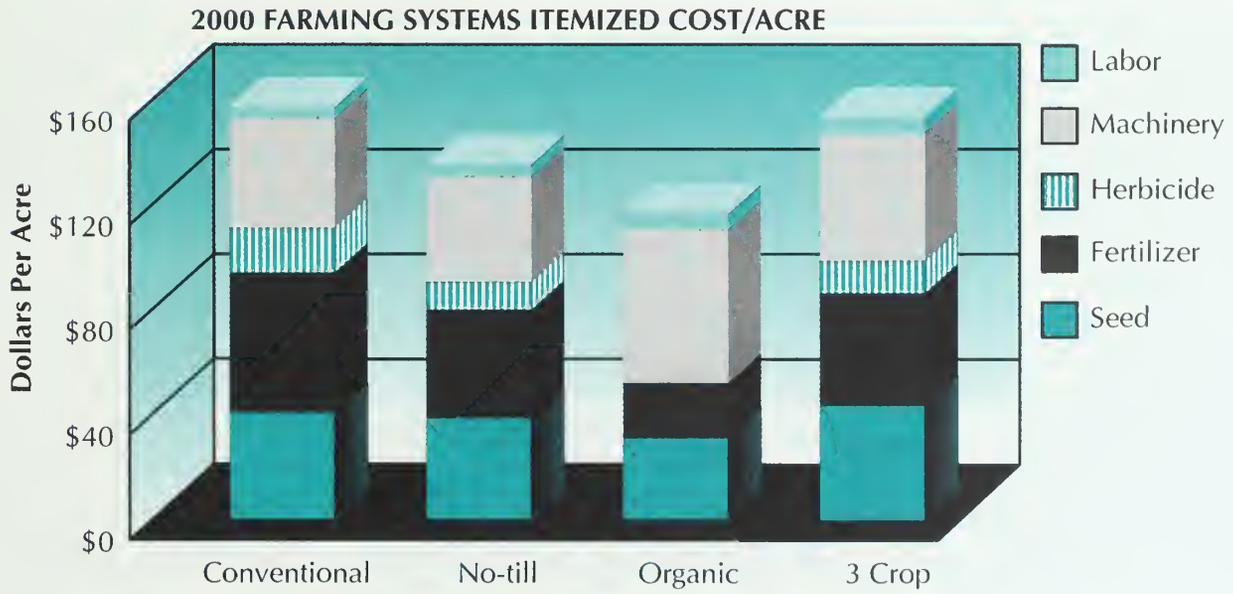
Item	Conventional	Mod. No-till	Organic	Three Crop
Seed	$35.80	$32.94	$24.32	$34.08
Fertilizer	$49.33	$39.02	$23.56	$45.39
Pesticides	$25.59	$13.02	$0.00	$14.80
Machinery	$39.73	$42.76	$61.09	$52.17
Labor	$3.93	$4.21	$6.87	$5.27
Total Cost	**$154.38**	**$131.94**	**$115.84**	**$151.72**

The corn and soybeans grown in this system tend to be specialty crops such as popcorn, or soybeans intended for tofu. Each of the above three farming systems are approximately 100 acres in area.

Three Crop System: This system includes 186 acres in corn-soybean-small grain. The corn in this rotation received 187 pounds per acre of nitrogen fertilizer in 2000. Herbicides are applied in moderation. The corn is spring-tilled and the soybeans and small grain in this system are no-till. None of the four farming systems are replicated.

Economic Observations

The Organic System produced the highest net return for four of the five years, and has the highest average net return per acre, at $263. The Organic System has an average cost of $112 / acre, second lowest. The No-till System has had the lowest average cost per acre, at $107 and the second highest average net return per acre, $202. The Conventional System has a



Dollar for Dollar, continued

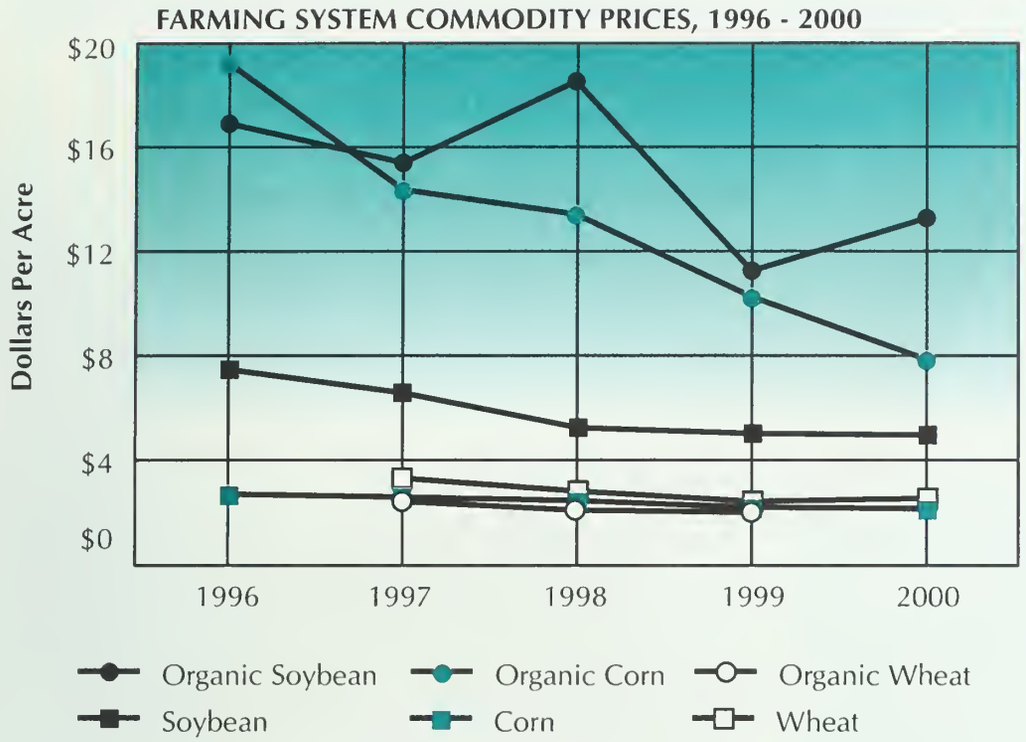
lower return per acre than the No-till System, $189, and the highest average cost per acre of all four systems, $162.

In its first two years the Three Crop System produced a net return per acre of $162 and had costs of $141 per acre. The Organic System has done well because organic commodity prices have been high relative to conventional commodity prices, and because the Organic System costs have been kept low. 1999 showed a decrease in Organic commodity prices and a decrease in Organic System returns. But in 2000, the farmer replaced popcorn with blue corn and substantially increased overall returns to the Organic System over 1999. Lower pesticide, fertilizer, machine and labor costs for the No-till system have keep it competitive. High costs and low commodity prices have put the Conventional System at a disadvantage. Particularly high fertility costs and low wheat and soybean prices during the first two year of the Three Crop System produced low returns.

Over the past five years the Organic System netted, on average, $61 / acre more than the No-till System, $74 / acre more than the Conventional System, and $101 / acre more than the first two years of the Three Crop System. While those numbers may exaggerate the advantage of the Organic System because the analysis uses actual prices received for the Organic System commodities (as opposed to an average price received for the other systems), it is clear that for the past four years the organic commodities market has been stronger than the conventional commodities market, with the exception of wheat prices.

Whether the Organic System can remain competitive depends to a large extent on whether organic commodity prices remain high. Allen Williams said that profitable marketing of organic cereal grains is very difficult. The proposed national organic production standards will likely have an effect on the organic commodities market, especially the livestock production standards, which will require the use of 100% organic feed. This new market may sustain demand for organic grain. Williams continues to explore new markets and new crops.

How do the Conventional and No-till Systems compare? The No-till System net return per acre averaged $13 more than the Conventional System over the five year period. The major reason for the higher average return of the No-till System is the cost savings. The No-till System cost averaged $107 / acre,



while the Conventional System cost averaged $162 / acre. The No-till System is using spring tillage on corn and the Conventional System is using no-till soybeans on part of its acreage, so that these two farming systems are becoming more similar. It will be interesting to see how the budgets of these two systems compare in the coming seasons.

Water quality and soil quality (ISQI) studies of the three farming systems are now being conducted by University of Illinois researchers. The information from those investigations will add an environmental dimension to the evaluation of the farming systems.

Funding for the Farming Systems Comparison project is provided in part by a grant from the Illinois Department of Agriculture Conservation 2000, Sustainable Agriculture Grant Program. For the complete report, visit: http://todggg.tripod.com/Web-docs/Report-6-01.htm

Photos on pages 8-11 were taken at the Stewardship Farm near Cerro Gordo, Illinois.

USDA SARE Program Awards 91 Grants in 2001 in Support of Sustainable Agriculture

The U.S. Department of Agriculture (USDA) Sustainable Ag Research and Education (SARE) program will invest a total of nearly $2.3 million in 91 grants to organizations, institutions and individuals in the North Central region. These funds support researchers, educators and farmers and ranchers in their quest to make agriculture more sustainable economically, environmentally and socially. "In our 14th year of awarding sustainable agriculture grants, we continue to help scientists, farmers and others search for creative solutions to agricultural problems," said Deborah Cavanaugh-Grant, member of North Central Region SARE's Administrative Council. "These grants represent positive opportunities to improve agriculture for not only the agricultural community, but the general public as well."

Awards will be distributed under three competitive grant programs:

$1,239,839 to 18 projects in the **Research and Education Grant Program**: Awarded to scientists, educators and other organizations and multi-disciplinary teams exploring sustainable systems and practices.

$469,773 to 8 projects and $207,000 to 12 land grant universities in the **Professional Development Program**: Awarded to collaborative teams developing sustainable agriculture educational programs for agricultural educators and to land grants for implementing sustainable agriculture educational programs.

$368,865 to 53 projects in the **Producer Grant Program**: Awarded to farmers and ranchers experimenting with sustainable agriculture on individual operations and with farmer groups.

New project coordinators from 12 North Central states will explore a wide variety of topics addressing sustainable agriculture, including: agroforestry, aquaculture, organic systems, marketing, sustainable agriculture education, livestock systems, soil fertility, inclusion of minority farmers, crop diversification, value-added products, vegetable crops and many others.

Funding for the popular Producer Grant Program has more than tripled since its inception in 1992. In 2001, the USDA's National Agroforestry Center contributed approximately $19,110 to 5 projects in the producer program.

North Central SARE's Administrative Council and Technical Committee met four times in 2001 to review and recommend proposals. Composed of agricultural educators and researchers, producers and nonprofit organization representatives, the Council submitted its 2001 recommendations to the USDA for final approval.

The next grant cycle (2002) is as follows:

Research and Education Grant Program: Call for Preproposals July 2002, due September 2002.

Professional Development Program: Call for Proposals September 2001, due February 2002.

Producer Grant Program: Call for proposals February 2002, due March 2002.

Abstracts and contact information from funded projects can be found on a fully searchable database at www.sare.org/projects. Here, users can browse and search thousands of sustainable agriculture projects from across the nation. Information products from SARE's Sustainable Agriculture Network (SAN) also include SARE research results. Find SAN products at www.sare.org or contact SAN at (301) 504-6425 or san@nal.usda.gov .

For North Central region newsletters, project reports, grant applications and other information, contact North Central Region SARE at the University of Nebraska, 13A Activities Bldg., PO Box 830840, Lincoln, NE 68583-0840; (402) 472-7081; (402) 472-0280 (fax); or ncrsare@unl.edu or visit www.sare.org/ncrsare. The North Central region consists of: Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota, and Wisconsin.

$43,988 Awarded to Illinois Program

Production of Black Bass in Southern Illinois Coal Mine Lakes, Pam Wilkey, farmer, Carterville, (618) 985-3933, colt@midwest.net, **$5,000**

Re-Introduction of Flax as a Viable Economic and Rotational Crop in an Organic System (Phase II), Joel Rissman, farmer, Waterman, (815) 264-3487, rissmanorganics@thestix.net, **$3,110**

North Central Region Paddlefish Polyculture, Scott Miller, farmer, Chrisman, (217) 465-5486, kami@tigerpaw.com, **$14,348**

Alternative Agriculture in Southern Illinois, Robert Boyd, farmer, Cobden, (618) 833-6409, beejay@midwest.net, **$2,530**

Illinois State Plan for Sustainable Agriculture Education, Deborah Cavanaugh-Grant, University of Illinois, (217) 968-5512, cavanaughd@mail.aces.uiuc.edu, **$19,000**

GRANT WRITING WORKSHOPS

Illinois producers and agriculture professionals can find out how to write grant proposals for two sustainable agriculture programs—North Central Region Sustainable Agriculture Research and Education (NCR SARE) Producer Grant Program and the Illinois Department of Agriculture's C-2000 Sustainable Agriculture Program at four workshops in February.

The workshops will include information to help farmers compete for grants from the North Central Region Sustainable Agriculture Research and Education (NCR SARE) Producer Grant Program. Producers interested in research, demonstrations or educating others about profitable, environmentally sound, socially responsible agricultural are encouraged to apply.

"The Producer Grant Program emphasizes the importance of farmer-driven research and indigenous knowledge," says Ken Schneider, former farmer/rancher and NCR SARE's producer grant liaison. "We support innovative farmers and ranchers looking for ways to overcome obstacles to a sustainable option."

In 2002, producer grants will be awarded in amounts up to $6,000. Group projects (three or more producers) can be funded up to the $18,000 maximum. Funds will become available to successful applicants in fall 2002.

This year's workshops will also include information about the Illinois Department of Agriculture's C-2000 Sustainable Agriculture Grant Program. The program provides funds for agencies, organizations and individuals for (1) on-farm research and demonstration; (2) outreach and education; and (3) university research.

The workshops, conducted by the University of Illinois Agroecology/Sustainable Agriculture Program, will explain both programs and requirements to receive funding. A producer grant recipient will be at each workshop program to relate the farmer experience in the NCR SARE Producer Grant Program. Facilitators will be available for individual assistance. The workshops are co-sponsored by the University of Illinois Extension, Illinois Department of Agriculture and the Illinois Sustainable Agriculture Society. **All workshops will be conducted from 10:00 a.m. to noon.**

February 4

University of Illinois Extension, McLean County
402 N. Hershey, Bloomington

February 7

University of Illinois Extension
Warren County Farm Bureau Building,
1000 North Main St., Monmouth

February 11

University of Illinois Extension, Marion County
1404 East Main, Route 50 East, Salem

February 14

University of Illinois Extension, Macoupin County
210 N. Broad St., Carlinville

For more information, check the NCR SARE Web site, http://www.sare.org/ncrsare/, or contact Deborah Cavanaugh-Grant at (217) 968-5512; cavanaughd@mail.aces.uiuc.edu

Resources on the Web

Three new free selections from the book, The Farmers' Market: Farm-Fresh Ideas for Producers, Managers & Communities, are available as free PDF downloads at www.nwpub.net.

They are:

- Educating the Public About Local Agriculture & Farmers' Markets
- Getting Top Dollar for What You Sell at Farmers' Markets
- Top Trends in Farmers' Markets

Additional free selections posted earlier include:

- Hottest Products to sell
- Selling to Ethnic Groups
- Getting Grants for Your Market
- Special Events for Your Market
- Market Issues & How To Deal With Them
- The Farmers' Market Salad Bar Program
- The Farmers' Market School Lunch Program
- Benefits of Farmers' Markets for Farmers, Customers & Communities
- Resources from "Embracing the Community" & "Expanding the Vision" chapters.

On the Research Front

Program of Incentives Needed for Sustainable Farming

Regardless of how good sustainable agriculture practices are for the future of the environment, agriculture economists believe that the practices will not be embraced until financial incentives are involved. Sustainable agricultural practices that increase the efficiency with which fertilizers and pesticides are used during crop production, such as precision farming, drip irrigation and Integrated Pest Management, have the potential to be both profitable and environmentally beneficial because they may increase yield or reduce input costs. However, their financial and environmental benefits are likely to vary across farmers, soil conditions and crops. Many farmers may not find it profitable to adopt technologies that may be environmentally beneficial.

"The key to sustainability is the use of incentives to develop improved technologies and to promote the use of efficiency-increasing technologies that are available and under-utilized," says Madhu Khanna, associate professor in Agricultural and Consumer Economics at the University of Illinois. Her analysis shows that incentives in the form of subsidies for adopting sustainable agricultural practices or penalties for environmental contamination can induce greater adoption of conservation practices.

Knowledge and education across disciplines is important for designing incentives that are effective. Khanna says that there needs to be mutual education of economics and environmental studies among environmentalists, biologists, soil scientists and economists. Environmental economists need to be better educated about biological/agronomic systems and visa versa.

"The key to sustainability is the use of incentives to develop improved technologies and to promote the use of efficiency-increasing technologies that are available and under-utilized,"

"Additionally, it is important to educate farmers and the public at large about the economic value of preserving environmental quality," says Khanna, "Support for sustainability will increase as more people appreciate the benefits and options that environmental amenities provide."

Excerpted from a paper entitled, "Economics of new technologies for sustainable agriculture" by David Zilberman from the University of California at Berkeley, Madhu Khanna from the University of Illinois, and Leslie Lipper, from the University of California at Berkeley.

Madhu Khanna

CALENDAR

10th Annual National No-Tillage Conference
Jan. 9-12, 2002 , St. Louis, MO.
For more information call (262) 782-4480 or visit:
http://www.lesspub.com/nntc
National No-tillage Conference
P.O. Box 624, Brookfield, WI 53008-0624
E-mail questions to: info@lesspub.com

22nd Annual Ecological Farming Conference
January 23-26, 2002
Asilomar Conference Center, Pacific Grove, CA
For more information call (831) 763-2111 or visit:
http://www.eco-farm.org
Ecological Farming Association
406 Main Street, Suite 313
Watsonville, CA 95076
FAX: (831) 763-2112

Farm Conservation Programs TeleNet
January 24, 2002, TeleNet

With commodity prices below break-even levels, agricultural landowners and producers are re-examining their farming decisions, especially row-crop production on environmentally sensitive lands.

To help landowners and producers evaluate their options, a statewide Farm Conservation Programs TeleNet has been scheduled from 9:00 a.m. to 12:00 Noon on Thursday, January 24, 2002 at participating local University of Illinois Extension Unit Offices.

The purpose of the Farm Conservation Programs TeleNet is to educate extension and agency staff, and landowners about basic provisions, economic incentives, cost-share rates, technical support, ranking criteria and sign-up periods of the following programs: The Conservation Reserve Program (CRP), Environmental Quality Incentives Program (EQIP), Wetland Reserve, Wildlife Habitat Incentives Program (WHIP), Illinois Rivers 2020; the Illinois Buffer Strip Initiative, the Conservation Reserve Enhancement Program (CREP), and Illinois' Conservation 2000 Agriculture Resource Enhancements. Experts will be on-line to answer questions.

University of Illinois Extension is sponsoring this program in cooperation with the Natural Resources Conservation Service (NRCS), Farm Services Agency (FSA), Illinois Department of Agriculture (IDA), Illinois Department of Natural Resources (IDNR), Illinois Environmental Protection Agency (IEPA), Illinois Council for Food and Agricultural Research (C-FAR), and the Association of Soil and Water Conservation Districts (AISWCD).

Pre-registration is necessary given space limitations and the need to distribute information packets prior to the TeleNet. Register by contacting your local U of I Extension Office. For more information call Bob Frazee, University of Illinois Natural Resources Educator at (309)694-7501.

Illinois Tillage Conference
February 12, 2002
Bloomington, IL

A statewide conference, with the theme "Tillage & Nutrient Management for the Future: Advanced Concepts" is scheduled for Tuesday, February 12, 2002 at the Interstate Center, Bloomington, IL (located 1 mile west of the intersection of Interstate 74 and IL Rt. 9 at Exit 160-A). The program, featuring state and nationally known speakers, runs from 8:30 a.m. to 3:30 p.m.

The conference is being co-sponsored by the Illinois Department of Agriculture, University of Illinois Extension, Natural Resources Conservation Service, Soil and Water Conservation Districts, and the Soil and Water Conservation Society-Illinois Chapter. Seed, chemical, machinery dealers, as well as other agri-businesses will be featured as exhibitors.

Topics include: 2001 Farm Bill How Green and Will the Check Continue to be in the Mail? Enhancing Soil Livestock; The Keys to Nitrogen Mineralization/Immobilization; Farming the Carbon Cycle; SOILS Project Results; and WATER Project Results. A panel of three innovative farmers will provide their perspectives on Ground Zero for Nutrient Management & Conservation Tillage Application. A complete agenda, listing topics and speakers, will appear in the next newsletter.

Pre-registration is necessary. The deadline is Tuesday, February 5, 2002. Seating is limited so registration will be taken on a first-come basis. A $15 per person fee will be charged to cover room rental and noon luncheon. Please make your check payable to the "McLean County SWCD."

To register, include the following information with your check: IL Tillage Conference, your name, address, & county of residence.

Please mail to:
McLean County SWCD
402 N. Kays Drive
Normal, IL 61761

For more information, please call Bob Frazee, U of I Natural Resources Educator at (309) 694-7501 or Alan Gulso, Water Quality Coordinator, IL Dept. of Agriculture at (217) 782-6297; E-mail: agulso@agr.state.il.us

Sustainable Agriculture Conference to Highlight Illinois Research

February 19 & 20, 2002

The Illinois Sustainable Agriculture Committee of the Conservation 2000, Sustainable Agriculture Grant Program at the Illinois Department of Agriculture announces a conference highlighting sustainable agriculture research and education in Illinois.

"Research and Education for Shared Progress" is scheduled for February 19 and 20, 2002 at the Northfield Inn, Suites and Conference Center in Springfield, Illinois. The conference will highlight a broad range of research and education projects funded by the Illinois Council on Food and Agricultural Research (C-FAR), North Central SARE and Illinois' funding program, C-2000 Sustainable Ag Grant Program.

"Two years ago we held a conference showcasing the C-2000 projects," said Mike Rahe, Sustainable Ag Coordinator at the Illinois Department of Agriculture. "This year the Committee wanted to open it up and feature all the research and education projects going on in sustainable ag in the state." Over 55 sessions will be held covering a broad array of production and marketing topics related to sustainable agriculture.

"This conference will have something for everyone," said Dan Anderson, Chairman of Illinois Sustainable Ag Committee. "Farmers, consumers and researchers need to work together to secure the future of our food system."

Keynote speaker, Fred Kirschenmann, Director of the Leopold Center for Sustainable Agriculture at Iowa State University, will address the conference on the role of research in developing a sustainable agriculture. David Baltensperger, Director of the North Central SARE Program will also speak.

Registration is $35 and will include two lunches, and a wine reception on the evening of the 19th. Continuing education credits will be offered for most of the sessions. On-line registration is available at http://www.aces.uiuc.edu/~asap/conference.html, or to register by phone call Barb Russell at (217) 333-0240.

AGRO-ECOLOGY
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